TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

AGENDA ITEM REQUEST

AGENDA REQUESTED: March 30, 2010

DATE OF REQUEST: March 11, 2010

NAME & NUMBER OF PERSON TO CONTACT REGARDING CHANGES TO THIS REQUEST, IF NEEDED: Kerry Howard, 239-0556

CAPTION: Docket No. 2010-0047-MIS. Consideration of the adoption of revisions to *Texas Emissions Reduction Plan: Guidelines for Emissions Reduction Incentive Grants (RG-388).*

The revisions to the guidelines will implement changes to the Texas Emissions Reduction Plan (TERP) as authorized in House Bill 1796, 81st Texas Legislature, 2009. Additional revisions to the guidelines were also proposed by the Executive Director.

Copies of the draft revised Guidelines were made available for public comment in accordance with the provisions of Texas Health and Safety Code, Section 386.053. The commission received comments on the proposed revisions to the guidelines. Those comments have been considered and responded to in the Executive Director's Response to Comments. (Steve Dayton, Ben Rhem)

Richard C. Chism
Chief Engineer for Susana M. Hildebrand

Bill Miller for David Brymer
Division Director

Kerry Howard
Agenda Coordinator

Copy to CCC Secretary? NO_X_ YES____

Texas Commission on Environmental Quality

INTEROFFICE MEMORANDUM

To: Commissioners **Date:** March 11, 2010

Thru: LaDonna Castañuela, Chief Clerk
Mark R. Vickery, P.G., Executive Director

From: Susana M. Hildebrand, P.E., Chief Engineer

Docket No.: 2010-0047-MIS

Subject: Commission Approval for Adoption of Revisions to
Texas Emissions Reduction Plan: Emissions Reduction Incentive Grants (RG-388)

Scope:

The revisions implement changes to the Texas Emissions Reduction Plan (TERP) grant program criteria as authorized under House Bill (HB) 1796, 81st Texas Legislature, 2009, and other revisions proposed by the Executive Director.

Reasons for the changes:

Texas Health and Safety Code, §386.053 directs the commission to adopt guidelines and criteria for the grant programs authorized under the Texas Emissions Reduction Plan (TERP). The current guidelines, *Texas Emissions Reduction Plan - Guidelines for Emissions Reduction Incentive Grants* (RG-388), were adopted by the commission in December 2007. The guidelines establish the detailed criteria and requirements for grant projects funded under the TERP.

Subsequent to the last revision to the guidelines, the commission made a number of decisions and provided direction to staff that more specifically defined some of the grant criteria and requirements. In addition, HB 1796 revised the eligibility criteria for grants under the TERP. Revisions to the TERP rules (30 TAC Chapter 114, Subchapter K, Division 3) to incorporate applicable changes are scheduled for consideration by the commission on February 24, 2010. The guidelines need to be revised to incorporate the statutory and regulatory changes and to update the criteria and requirements.

The proposed revisions to the guidelines are presented in the attached draft document along with a summary table listing the changes.

Statutory authority:

The revised guidelines are adopted under Texas Health and Safety Code, §386.053(d), which authorizes the commission to revise the guidelines and criteria for the TERP as necessary to improve the ability of the plan to achieve its goals. The revised guidelines are also adopted as part of the implementation of HB 1796.

Re: Docket No. 2010-0047-MIS

Potentially controversial matters:

The public comments generally supported the changes to the guidelines, with some additional recommendations as explained in the attached response to comments. No controversial matters are expected.

Public comment:

The proposed revisions to the guidelines were made available for public comment in accordance with the provisions of Texas Health and Safety Code, §386.053. Notice of the proposed revisions was published in nine major newspapers within the TERP eligible counties, posted on the TERP Web site, sent by electronic mail to the TERP listserv, mailed to the TERP Advisory Board, and mailed to the United States Environmental Protection Agency (EPA) Region 6.

A public meeting on the proposed revisions to the guidelines was held on January 7, 2010, at the Texas Commission on Environmental Quality in Austin, Texas.

The commission received written and/or oral comments from 12 entities and individuals regarding the proposed revisions to the guidelines. Comments were received from the EPA Region 6, North Central Texas Council of Governments, Clean Energy Fuels, National Railway Equipment Company, HOLT CAT, ICF International, Emisstar, Waukesha-Pearce Industries, Inc., San Antonio River Authority, TriDal, Ltd., and two individuals.

A summary of the comments received and the response to the comments is included in the attached Executive Director's Response to Comments.

Significant changes from proposal and recommendations:

No changes from the original proposed revisions to the guidelines are recommended. However, revisions to the TERP rules are scheduled for consideration by the commission on February 24, 2010. Decisions by the commission regarding the rule changes may affect some of the proposed revisions to the guidelines.

The Executive Director recommends adoption of the revised guidelines as proposed, with authorization to make changes as needed to reflect the commission's final decisions on the TERP rules and to make any needed non-substantive changes to formatting or to correct errors.

Agency contacts:

Mr. Steve Dayton, Project Manager, Air Quality Division, 239-6824
Mr. Ben Rhem, Staff Attorney, Environmental Law Division, 239-6501

Attachments

Re: Docket No. 2010-0047-MIS

cc: Chief Clerk, 5 copies
Executive Director's Office
Susana M. Hildebrand, P.E.
Kevin Patteson
Curtis Seaton
Daniel Womack
Office of General Counsel
Steve Dayton
David Brymer

Proposed Revisions to
Texas Emissions Reduction Plan
Guidelines for Emissions Reduction Incentive Grants (RG-388)

A. IMPLEMENTATION OF STATUTORY CHANGES

1. Chapter 2, Glossary
   (page 6)
   The definition of stationary engine was modified to include, "a machine used in non-mobile applications that converts fuel into mechanical motion, including turbines and other internal combustion devices."

   Reason:
   House Bill 1796, 81st Texas Legislature, 2009, added a definition of stationary engine to Texas Health and Safety Code Chapter 386. The change to the definition in the Guidelines is consistent with the new statutory definition. With this change turbine engines will be eligible for TERP funding under the stationary equipment project category.

2. Appendix 2 (Non-road)
   (page 62)
   Language was added to exclude non-road equipment used for natural gas recovery purposes from the requirement that equipment be used at least 75 percent of the annual usage in the eligible counties. Under this change, natural gas recovery equipment must still be used in the eligible counties for the total hours of use over the activity life necessary to meet the emission reduction commitments and the cost-effectiveness requirements.

   Reason:
   House Bill 1796, 81st Texas Legislature, 2009, revised the percentage of use requirements for non-road equipment used for natural gas recovery purposes. The change to the Guidelines implements this revision.

B. REVISIONS TO CLARIFY EXISTING REQUIREMENTS

1. Chapter 2, Glossary
   (page 5)
   The definition of "activity life" was modified to state that the TCEQ will establish the start date for each type of activity and that for replacement and repower projects the start date will usually be once the TCEQ verifies that proper disposal of the vehicle, equipment, and/or engine has occurred.

   Reason:
   This change reflects current practice and establishes in the Guidelines that the TCEQ will set the Activity Life start dates. The additional language also discusses when the TCEQ will start the Activity Life for replacement and repower projects.

2. Chapters 4-7, Emission Reduction Commitment Section
(pages 18-19, 24-25, 30, 33, and 36)
Language was added and modified to clarify the commitments that must be met by the grant recipients to achieve the emissions reductions and how the TCEQ may impose and enforce those commitments. The changes are summarized below.
   - The revisions make it clear that grant recipients are responsible for performing the activities defined in the grant contract necessary to achieve the calculated NO_x emissions reductions in the eligible areas.
   - Language is added to authorize the TCEQ, in determining whether to require return of all or a pro-rata share of the grant funds, to consider whether the intent of the program has been met, including consideration of good-faith efforts by the grant recipient to meet the commitments and other factors that may have adversely impacted the ability of the grant recipient to use the grant-funded vehicle or equipment.
   - The added language authorizes the TCEQ to include an annual NO_x emission reduction commitment in the grant contract, in addition to the commitment over the project life. The TCEQ may require return of grant funds based on under-achievement of the annual commitments at its discretion, particularly where it appears that it is unlikely that the grant recipient will be able to meet the project life commitments.
   - The added language authorizes the TCEQ to work with a grantee to implement other options for ensuring that the emission reduction commitments will be achieved, before a return of grant funds is required.
   - Authorization is provided to allow the TCEQ to use either defined usage commitments by each grant recipient or a default usage rate for each of the different grant programs included under the Guidelines.
   - The revisions also make it clear that, in addition to the usage and emission reduction commitments, grant recipients must agree to operate the grant-funded vehicle or equipment for a minimum percentage of the annual and/or total usage.

   Reason:
   The changes and additional language are consistent with current practice and policies.

3. Chapter 5, Eligible Activities Section
(page 22)
Language was added to clarify that the TCEQ may establish default usage rates to determine the rebate grant funding amounts. The new language also authorizes the TCEQ to set minimum average annual usage amounts for vehicles and equipment being replaced under a rebate grant.

   Reason:
   The language regarding default usage rates is consistent with how the TCEQ has implemented the rebate program.

   The language authorizing the TCEQ to set a minimum average usage amount for vehicles and equipment being replaced is a new provision. This additional language is proposed to allow the TCEQ, at its discretion, to set a minimum historical vehicle or equipment usage amount on an annual basis in order to be eligible for replacement under a rebate grant.

In accordance with the statutory direction to make obtaining a rebate grant a fast and simple process, the TCEQ uses default usage rates to determine the eligible rebate grant amounts, rather than calculating the emissions reductions and grant amounts based on the individual usage of each vehicle or piece of equipment. Although this approach has resulted in a very successful rebate grant program, it leaves the possibility that vehicles and equipment that have only been minimally used may qualify for a replacement or repower grant. The proposed change will give the TCEQ authority to set a minimum historical usage amount in order to be eligible for a rebate grant, as may be needed to ensure that vehicles, equipment, and engines submitted for replacement are currently operational and are being used on a regular basis.

4. Appendices 1-5, Purchase or Lease Sections
(pages 37, 55, 72, 88, and 101)
Language was added to clarify that the vehicle or equipment used to determine a baseline price used to establish the incremental cost of the project must be new (i.e., not previously purchased) and may not be a used unit (i.e., being resold after the original purchase).

Reason:
Under this project category, the engine on the vehicle or equipment proposed for purchase or lease must be certified to emit at least 25 percent less NO_x than the federal emission standard applicable to that engine. The incremental cost used to determine an eligible grant amount is the difference between the cost of the reduced-emission vehicle or equipment and a comparable vehicle or equipment that only meets the federal emission standard.

Some potential grant applicants have expressed confusion regarding whether the baseline vehicle or equipment used for comparison can be a "used" model, as long as it meets the current federal emission standards. The proposed change to the Guidelines would make it clear that the vehicle or equipment used for the price comparison must be a "new" unit.

5. Appendix 1, Replacement Section
(page 38-39)
This section was modified to clarify the requirements for ownership and use of the vehicle being replaced, including additional information on authorized exemptions to the ownership requirements.
   - The added language makes it clear that the applicant must have "continuously" owned the vehicle being replaced for the preceding two years and that the applicant's name must be listed on the front of the vehicle title document.
   - The changes also make it clear that the vehicle must have been registered and inspected over the preceding two years.
   - Additional information is added to explain possible exemptions to the registration requirements, including seasonal use appropriate for the vocation of the vehicle and use exclusively for non-road purposes.

- Language is added to clarify the requirement that the vehicle being purchased must be the same type as the vehicle being replaced, including the same weight category and body and axle configuration. The new language authorizes the TCEQ to accept replacement with a different type of vehicle to account for the latest technology used for a specific vocation.

  Reason:
  This language is consistent with how the TCEQ has implemented the grant program.

6. Appendix 1, Project Criteria Section
   (page 44)
   Language was added stating that the TCEQ may establish a minimum percentage requirement for use of the vehicle in the eligible counties with each grant application period.

   Reason:
   When the statute was changed to include travel on designated highways and roadways in the annual usage requirements the new language did not specify a minimum amount of travel that must occur strictly in the eligible counties. In implementing this requirement, the TCEQ decided on a minimum usage of 25 percent in the eligible counties to avoid having to process applications with only a small amount of creditable emission reductions in the eligible counties. The added language will make this approach permanent in the Guidelines.

7. Appendices 1-5, Project Criteria Sections
   (pages 41, 59, 75, 91, and 104)
   Language was added stating that the applicant must own the vehicle or equipment being replaced, repowered, or retrofitted.

   Reason:
   This change is consistent with how the TCEQ has implemented the program. In some cases, entities that were leasing a vehicle or piece of equipment have attempted to apply for a grant to replace or upgrade that vehicle or equipment. In addition, some entities have applied to repower a piece of equipment that they did not yet own and that they intended to purchase only if they received a grant.

   The added language will make it clear that the applicant must already own the vehicle or equipment to be replaced, repowered, or retrofitted before an application is submitted.

C. PROPOSED SIGNIFICANT CHANGES

1. Appendix 1. Project Criteria Section
   (page 45)
   Language was added to clarify that terminal tractors used at port facilities and other inter-modal delivery and transportation facilities may be considered non-road equipment for purposes of applying for a TERP grant, regardless of whether the vehicle has a non-road or on-road certified engine.

Reason:
Terminal tractors and yard trucks used at port facilities and other inter-modal transportation facilities may be configured for either on-road or non-road use. However, most of the work performed by these vehicles is the same. The main difference is that the on-road vehicles may also travel short distances on streets and roadways to move containers and materials between sites.

The grant program requirements differ between on-road vehicle projects and non-road equipment projects, including how the emission reductions are calculated. The usage factor for the on-road vehicle project calculations is miles of operation, while hours of operation are used for non-road equipment projects.

Most of the terminal tractors certified for on-road use may travel only a minimal amount of annual miles even though the engines operate a significant number of hours as the vehicles are loaded, moved, and unloaded. This difference in how the emissions reductions are calculated has resulted in the on-road terminal tractor projects qualifying for less grant funds than equivalent projects involving the non-road tractors, as well as the TCEQ not being able to count the full amount of emissions reductions that may be associated with the project.

The proposed change will allow applicants to apply under the non-road project standards for both types of terminal tractors. This provision will only apply to vehicles specifically manufactured as a terminal tractor and not to other types of on-road vehicles that are being used for the same purpose as a terminal tractor.

2. Appendices 1 and 4, Calculating NO_x Emissions Reductions Sections
(pages 49 and 96)
Language was added regarding the calculation of emission reductions based on annual fuel use.

Reason:
Where fuel use is the usage factor for the emission reduction calculations, the additional language makes it clear that the TCEQ may consider the fuel economy benefits of the new vehicle, locomotive, and/or engine when calculating the emissions reductions, in addition to just considering the lower emission rate of the new engine.

New locomotives also must have a start-stop device installed to reduce engine idling. The additional language explains how the TCEQ may account for the emission reductions associated with the reduced idle time.

The language explains that the TCEQ may accept, at its discretion, the fuel economy benefits from the new type of vehicle or locomotive, as well as from the anti-idling devices on new locomotives. If accepted, the TCEQ would establish a factor to apply to the fuel use of the reduced-emission vehicle or locomotive to determine the baseline fuel use of the original vehicle or locomotive. The difference in fuel use for the same amount of work will be included in the calculation of emissions reductions.

3. Appendices 3-5, Project Criteria Sections
(pages 77, 92, and 106)
Language was added regarding requirements for an existing engine that must meet a more stringent emissions standard under state or federal regulations at the time of replacement, overhaul, or remanufacture.

TERP grant funding may not be used for a project that is required under state or federal law, rule, or agreement. Under federal EPA rules, locomotives of certain model years must meet upgraded emission standards at the time the unit is overhauled or repowered. Similar requirements are in place in federal and state rules for certain stationary engines. In addition, recent changes to the EPA rules for marine vessels place similar requirements on certain marine engines.

The additional language authorizes the TCEQ to fund projects involving these engines, but the baseline emissions used to compare with the reduced emission rate must be set at the emission rate required of a repowered or overhauled engine under the federal or state law or rule.

Reason:
In instances where the engine upgrade requirements have no specific deadline or compliance date, it is not a given that the upgrades will ever be performed. For instance, many locomotive owners perform only partial overhauls on the locomotive engines, which are not included in the requirement to meet the stricter emission standards. To date, the TCEQ has not approved TERP funding for repowers or retrofit of engines covered by these requirements until the engine is first upgraded to the required emission standard.

However, engines and upgrade kits are available that would result in a much lower emission rate than the required standard. Prospective applicants have stated that if TERP funds were available for those projects they would be willing to upgrade to a much cleaner standard than just meeting the requirements.

This change would authorize the TCEQ to fund these types of projects, as long as the upgrade requirements do not include a compliance date. The emission rate used as the baseline for calculating the emission reductions would be the upgraded standard, and the project must result in at least a 25 percent reduction in NO_x emissions from that standard.

4. Appendix 4, Purchase or Lease Section
(page 88)
Language was added to clarify what is meant by "new locomotive." Under this change, a locomotive used for price comparison under the Purchase or Lease project category could include a remanufactured locomotive that meets the federal definition of "new."

Reason:
Under the project category, the eligible grant amount is determined by the difference in the cost of the reduced emission locomotive and a new locomotive that just meets the current federal emission standards.

However, it has been difficult for applicants desiring to apply under this category for the purchase or lease of a new generation of reduced-emission switcher locomotive to find a comparable new regular switcher locomotive for the price comparison. This is because, aside from the manufacture of new hybrid and generator set switcher locomotives, industry practice has been to remanufacture and refurbish old locomotives rather than manufacture "factory-new" switcher locomotives from scratch.

Recognizing this practice, the EPA has included remanufactured locomotives in its definition of a new locomotive for application of certain regulatory requirements. The proposed change to the Guidelines would authorize the TCEQ to consider these remanufactured locomotives as "new" under this project category in order to use the price of the remanufactured locomotive as a baseline to compare with a new reduced-emission switcher locomotive.

Texas Emissions Reduction Plan (TERP)
Guidelines for Emissions Reduction Incentive Grants (RG-388)
Response to Comments
Docket No. 2010-0047-MIS
March 11, 2010

PUBLIC COMMENT

The proposed revisions to *Texas Emissions Reduction Plan: Guidelines for Emissions Reduction Incentive Grants* (RG-388) were made available for public comment in accordance with the provisions of Texas Health and Safety Code, §386.053. Notice of the proposed revisions was published in nine major newspapers within the Texas Emissions Reduction Plan (TERP) eligible counties, posted on the TERP Web site, sent by electronic mail to the TERP listserv, mailed to the TERP Advisory Board, and mailed to the United States Environmental Protection Agency (EPA) Region 6.

A public meeting on the proposed revisions to the guidelines was held January 7, 2010, at the Texas Commission on Environmental Quality (TCEQ) in Austin, Texas.

The commission received written and/or oral comments from 12 entities and individuals regarding the proposed revisions to the guidelines. Comments were received from the EPA Region 6, North Central Texas Council of Governments (NCTCOG), Clean Energy Fuels (Clean Energy), National Railway Equipment Company (NREC), HOLT CAT (CAT), ICF International (ICF), Emisstar (EM), Waukesha-Pearce Industries, Inc. (WPI), San Antonio River Authority (SARA), TriDal, Ltd. (TD), and two individuals.

RESPONSE TO COMMENTS

IMPLEMENTATION OF STATUTORY CHANGES

The definition of stationary engine was modified to include, "a machine used in non-mobile applications that converts fuel into mechanical motion, including turbines and other internal combustion devices." With this change turbine engines will be eligible for TERP funding under the stationary equipment project category.
Chapter 2, Glossary, page 6

Language was added to exclude non-road equipment used for natural gas recovery purposes from the requirement that equipment be used at least 75 percent of the annual usage in the eligible counties. Under this change, natural gas recovery equipment must still be used in the eligible counties for a sufficient amount of use over the activity life to meet the emission reduction commitment and the cost-effectiveness requirements.
(Non-road), page 62

No comments were received regarding these two changes to implement new statutory requirements.

REVISIONS TO CLARIFY EXISTING REQUIREMENTS

The definition of "activity life" was modified to state that the TCEQ will establish the start date for each type of activity and that for replacement and repower projects the start date will be once the TCEQ verifies that proper disposal of the vehicle, equipment, and/or engine has occurred.
Chapter 2, Glossary, page 5

ICF recommended that the time frame for establishing the start date should be the date of when the equipment is delivered, not once the TCEQ has verified proper disposal of the old equipment.

The commission did not make any changes as a result of this comment. The emissions reductions attributable to the project may not be considered until the old equipment is taken out of service and destroyed. The TCEQ must receive verification of the proper disposal of the old equipment before the credit for the emissions reductions can be counted. The changes to the guidelines are made to ensure that current practice by the TCEQ is also explained in the guidelines.

NREC recommended an increase in the project life for locomotive projects. Locomotives replaced with GenSet can expect a project life of at least 50 years, compared to the 10-year activity life currently in place.

The commission did not make any changes as a result of this comment. The emissions reductions attributable to a replacement project are based on the assumption that, absent the grant, the old locomotive would continue to be used for the period in which the emissions reductions occur. The maximum activity life for each project category is established based on the time period in which old locomotives replaced under each project category could reasonably be expected to continue to be used. It would not be appropriate to set the activity life based on the expected life of the locomotive being purchased.

Language was added and modified to clarify the commitments that must be met by the grant recipients to achieve the emissions reductions and how the TCEQ may impose and enforce those commitments. The changes are summarized below.

- *The revisions make it clear that grant recipients are responsible for performing the activities defined in the grant contract necessary to achieve the calculated nitrogen oxides (NO_x) emissions reductions in the eligible areas.*
- *Language is added to authorize the TCEQ, in determining whether to require return of all or a pro-rata share of the grant funds, to consider whether the intent of the program has been met, including consideration of good-faith efforts by the grant recipient to meet the commitments and other factors that may have adversely impacted the ability of the grant recipient to use the grant-funded vehicle or equipment.*
- *The added language authorizes the TCEQ to include an annual NO_x emission reduction commitment in the grant contract, in addition to the commitment over the project life. The TCEQ may require return of grant funds based on under-achievement of the annual commitments at its discretion, particularly where it appears that it is unlikely that the grant recipient will be able to meet the project life commitments.*
- *The added language authorizes the TCEQ to work with a grantee to implement other options for ensuring that the emission reduction commitments will be achieved before a return of grant funds is required.*
- *Authorization is provided to allow the TCEQ to use either defined usage commitments by each grant recipient or a default usage rate for each of the different grant programs included under the Guidelines.*
- *The revisions also make it clear that, in addition to the usage and emission reduction*

commitments, grant recipients must agree to operate the grant-funded vehicle or equipment for a minimum percentage of the annual and/or total usage.

Chapters 4-7, Emission Reduction Commitment Section, pages 18-19, 24-25, 30, 33, and 36

ICF recommended that language concerning the emissions reduction commitments be included in the grant application forms. ICF commented that some applicants might not fully read through the TERP guidelines, and it is important to restate the requirements in the application forms.

TD recommended that consideration be given to the recent economic conditions when evaluating the usage for existing grantees that must currently report on the use of the grant-funded vehicles and equipment.

EM commented that the TCEQ should not punish program participants who meet their requirements early but continue to run their machines throughout the activity life. EM further stated that usage commitments have been challenged by change in workloads brought on by the recession of the past year. EM recommended that the TCEQ accommodate reasonable variation in usage rate per year and consider good faith efforts of the program participants in meeting requirements.

The commission did not make any changes as a result of these comments. The commission will consider these recommendations when implementing the usage requirements.

EM also commented on the provisions stating that if the TCEQ requires a return of a pro rata share of the grant funds for underachievement of the annual emissions reduction commitment, the TCEQ may revise the commitment over the remaining commitment life to a lower amount. EM commented that it was unclear whether or not program participants who underachieve emissions for several years will only pay back a portion of one year's worth of the grant before moving on to a revised usage commitment. EM expressed support for the changes as long as the original cost-effectiveness stated in the application is maintained.

The commission did not make any changes in response to this comment. Under this provision, the commission will take into account the original cost-effectiveness of the project when determining whether to change the emissions reduction commitments in the grant contract. This provision will be considered in conjunction with the evaluation of whether a grant recipient must return a pro rata share of the grant funds for failure to achieve the emissions reductions committed to in the original grant contract.

Language was added to clarify that the TCEQ may establish default usage rates to determine the rebate grant funding amounts. The new language also authorizes the TCEQ to set minimum average annual usage amounts for vehicles and equipment being replaced under a rebate grant.

Chapter 5, Eligible Activities Section, page 22

EM recommended that the TCEQ only implement a minimum average annual usage amount for vehicles or equipment in the rebate program whose grant request covers 60 percent or more of the incremental purchase cost. EM commented that lower mileage fleets, such as municipal and urban delivery fleets, for which the rebate programs makes sense may be at a disadvantage if minimum usage rates are implemented without consideration of the grant amount as a percentage of incremental cost.

NCTCOG recommended that the TCEQ consider the lower average annual usage accrued by local governments when determining the minimum thresholds.

The commission did not make any changes as a result of these comments. The commission will consider these recommendation if it establishes a minimum usage level for the rebate grants.

Language was added to clarify that the vehicle or equipment used to determine a baseline price used to establish the incremental cost of the project must be "new" and may not be a used version.
Appendices 1-5, Purchase or Lease Sections, pages 37, 55, 72, 88, and 101

ICF recommended expanding the proposed definition of "new" equipment to include something similar to "the current available year of the equipment, 2009 or 2010." ICF commented that a "new" piece of equipment could be new to a particular business and that stating the required year of the equipment would help clear up any confusion.

The commission did not make any changes as a result of these comments. Under these provisions, the determination of whether a piece of equipment qualifies as new equipment to be used for the price comparison will be based on whether the equipment is "factory new" and whether the equipment meets the current federal emissions standards. For some equipment, the previous year's model may qualify if it has never been sold and it is certified to the current standards. The commission will make that determination on a case-by-case basis.

ICF also recommended removing the "lease" option from the New Purchase or Lease project category. ICF commented that the lease option was very confusing to applicants and that the TCEQ should just stipulate outright ownership to avoid any confusion.

The commission did not make any changes as a result of these comments. The lease option is authorized by statute.

Language was modified to clarify the requirements for ownership and use of the vehicle being replaced, including additional information on authorized exemptions to the ownership requirements.

- *The added language makes it clear that the applicant must have "continuously" owned the vehicle being replaced for the preceding two years and that the applicant's name must be listed on the front of the vehicle title document.*
- *The changes also make it clear that the vehicle must have been registered and inspected over the preceding two years.*
- *Additional information is added to explain possible exemptions to the registration requirements, including seasonal use appropriate for the vocation of the vehicle and use exclusively for non-road purposes.*
- *Language is added to clarify the requirement that the vehicle being purchased must be the same type as the vehicle being replaced, including the same weight category and body and axle configuration. The new language authorizes the TCEQ to accept replacement with a different type of vehicle to account for the latest technology used for a specific vocation.*

Appendix 1, Replacement Section, page 38-39

EM recommended that the TCEQ expand its "like-for-like" requirements for non-road equipment so that equipment used for the same application and for the same amount of hours as the equipment being replaced will be considered eligible for purchase. EM provided an example where an owner of a rubber tire wheel loader wants to replace that unit with a tracked loader and will use the equipment for the same purpose and in the same manner as the old unit. EM also recommended that the application forms include more space for an applicant to provide a written justification of their decision to purchase a replacement unit with expanded or slightly different functionality as the unit being replaced.

In addition, EM, WPI, and ICF recommended that the TCEQ consider a "2-for-1" option for replacing older equipment with new or newer equipment. ICF commented that some businesses have wanted to become more efficient by replacing two older units with one new or newer unit and that the TCEQ could benefit by capturing more emissions reductions from these types of projects. WPI also recommended the following conditions be applied to the "2-for-1" replacement option: equipment being replaced is 10 years old or older; all current ownership and usage requirements are met; and reimbursements be limited to 60 percent of the replacement cost.

The commission did not make any changes based on this comment. In order to consider the emissions reductions valid, there must be a reasonable assurance that the equipment being replaced would have otherwise continued to be used for the same uses and for the period of time over which the emissions reductions are counted. The guidelines allow for some consideration of new types of equipment used for the same purposes as the old equipment. However, if the old equipment is obsolete and/or if the new equipment can be used for different uses and purposes than the equipment being replaced, there is a greater risk that the old equipment would not otherwise have done the work for which the new equipment is used. Similarly, the replacement of two pieces of equipment with one new piece of equipment presents the same types of risks that the old equipment would not have otherwise been used for the same work as the new equipment. The commission has determined that it is appropriate to continue with the current approach.

EM also commented that the TERP program should accommodate applications that replace a single piece of equipment that operates using two engines with a piece of equipment that operates using one engine.

The commission did not make any changes as a result of this comment. The guidelines do not preclude this approach, and the commission has funded projects in the past involving the replacement of equipment with two engines with a piece of equipment that operates using one engine.

Language was added stating that the TCEQ may establish a minimum percentage requirement for use of the vehicle in the eligible counties with each grant application period.
Appendix 1, Project Criteria Section, page 44

No comments were received regarding this provision.

Language was added stating that the applicant must own the vehicle or equipment being replaced, repowered, or retrofitted.
Appendices 1-5, Project Criteria Sections, pages 41, 59, 75, 91, and 104

No comments were received regarding this provision.

PROPOSED SIGNIFICANT CHANGES

Language was added to clarify that terminal tractors used at port facilities and other inter-modal delivery and transportation facilities may be considered non-road equipment for purposes of applying for a TERP grant, regardless of whether the vehicle has a non-road or on-road certified engine.
Appendix 1. Project Criteria Section, page 45

EPA and EM expressed support for the TCEQ allowing an applicant to apply for a project involving a terminal tractor with an on-road engine under the non-road forms and criteria. EM also

recommended that the TCEQ allow all terminal tractors to apply as off-road equipment without having to receive prior approval or having to complete any additional paperwork or forms.

The commission appreciates the support expressed for this change. The application forms will allow an applicant to apply using this approach. However, applicants should check with the TERP grants staff before applying to ensure that the vehicles meet the eligibility requirements.

Language was added regarding the calculation of emission reductions based on annual fuel use. Appendices 1 and 4, Calculating NO_x Emissions Reductions Sections, pages 49 and 96

EM, CAT, and EPA expressed support for accounting for increased fuel use efficiency in the emissions reduction calculations.

CAT recommended that the TCEQ also use this approach for projects where hours of operation are used to calculate the emissions reductions, rather than fuel use. CAT recommended that the TCEQ calculate the base grant amount based on the emissions reductions attributable to the use of a cleaner engine for a certain number of annual operating hours. CAT recommended that the TCEQ then calculate a supplemental grant amount based on the fuel economy improvements. CAT recommended that the TCEQ allow manufacturer documentation of improved fuel economy of the new engine to be used to verify the improvements to fuel economy.

EM recommended a similar approach, whereby the base emissions reductions are calculated and then supplemental emissions reductions are calculated based on fuel economy benefits. However, EM's comments did not specifically discuss the difference in approaches used for projects where the usage factor is hours of operation and those projects where the usage factor is fuel use.

The commission appreciates the support expressed for this change. Regarding the recommendations to also use fuel economy enhancements to be considered in projects where hours of operation are used to calculate the emissions reductions, the emissions reduction benefits of the newer engine are already accounted for in the certified emissions rate per hour of use of the engine. Factoring in an additional emissions reduction benefit based on improved fuel economy would double-count the emissions reductions. Therefore, this approach will only be used for projects where fuel use is used as the usage commitment. In those cases, the calculations will include consideration of both the difference in the emissions of the old and new engines and the emissions reductions that will result of the fuel economy benefits. The commission did not make any changes based on these comments.

Language was added regarding requirements for an existing engine that must meet a more stringent emissions standard under state or federal regulations at the time of replacement, overhaul, or remanufacture. The TERP grant funding may not be used for a project that is required under state or federal law, rule, or agreement. Under federal EPA rules, locomotives of certain model years must meet upgraded emission standards at the time the unit is overhauled or repowered. Similar requirements are in place in federal and state rules for certain stationary engines. In addition, recent changes to the EPA rules for marine vessels place similar requirements on certain marine engines. The additional language authorizes the TCEQ to fund projects involving these engines, but the baseline emissions used to compare with the reduced emission rate must be set at the emission rate required of a repowered or overhauled engine under the federal or state law or rule.
Appendices 3-5, Project Criteria Sections, pages 77, 92, and 106

EPA and NCTCOG expressed support for this change.

The commission appreciates the support expressed for this change.

Language was added to clarify what is meant by "new" locomotive. Under this change, a locomotive used for price comparison under the Purchase or Lease project category could include a remanufactured locomotive that meets the federal definition of "new."
Appendix 4, Purchase or Lease Section, page 88

The EPA expressed support for the clarification that the federal definition of a "new" locomotive may be used when determining the baseline price under the New Purchase or Lease project category.

The commission appreciates the support expressed for this change.

NREC commented that under the EPA "remanufacture" requirements, only Class 1 and passenger locomotives are subject to requirements for upgrading the emissions when the locomotive is rebuilt or remanufactured. NREC explained that Class 3 freight locomotives and locomotives manufactured before 1973 are exempt from the upgrade requirements to cleaner emissions. NREC recommended that under the guidelines, the baseline locomotive used for the price comparison should not have to meet current federal standards because the remanufacture of certain locomotives does not have to include an upgrade to new standards.

The commission did not make any changes as a result of this comment. The changes to the guidelines are intended to clarify what is meant by a "new" locomotive and to make the guidelines consistent with federal definitions. Rebuilt or remanufactured locomotives that have not been upgraded to new emissions standards will not meet the requirements.

OTHER COMMENTS

TD recommended that trade-ins be accepted as an asset towards the purchase of equipment on grant contracts.

This comment does not pertain to a provision in the guidelines. The use of trade-ins to cover some of the cost of the equipment is a financial management issue. The TCEQ previously included in the grant contract a requirement that the value of a trade-in applied to the purchase of grant-funded equipment could not be counted as a payment when determining the reimbursable costs. This provision was removed from the most recent grant contracts and trade-ins may be considered a payment for purposes of determining the reimbursable amount, subject to other program requirements.

Clean Energy recommended that the minimum activity life requirements be revised to allow funding for projects involving high-mileage on-road heavy-duty vehicles that, due to significant use, have a useful life of less than five years.

The commission did not make any changes based on these comments. The purpose of this program is to encourage the replacement or upgrade of vehicles that would not otherwise be replaced or upgraded if the grant were not awarded. As a result of reductions in the federal vehicle emission standards, the overall emissions from vehicles with a short average useful life will trend lower through regular turnover much faster than the overall emissions from vehicles with a longer average useful life. Therefore, it is important that the limited funding available for this program be targeted at the vehicles that would otherwise continue to operate for a much longer period of time before normal turnover would occur. In addition, the TCEQ may only count the emissions reductions for the state implementation plan (SIP) over the activity life during which the grant recipient is committed to using the vehicle or equipment. With expected changes to the federal standards for ground-level ozone, the deadline dates for strategies in the

SIP to result in reductions in ozone levels are expected to be extended, making it important that the emissions reductions achieved under the TERP occur over a longer period of time.

Clean Energy recommended that the TCEQ consider developing a streamlined application process for projects that would involve a significant number of new vehicles or projects. Clean Energy also recommended that only information needed to evaluate the proposal be required in the initial application and that information needed to assure compliance should be secured at a later time if the application is selected for an award.

The commission did not make any changes based on these comments. The information that must be included in the application forms is needed to ensure the eligibility of the project. The detailed information about each vehicle and engine is necessary to confirm the eligibility of the project under the guidelines and to perform the emissions reduction calculations. The TCEQ works with applicants to the extent time allows to obtain all necessary information and to correct errors in the application.

Clean Energy recommended that the TCEQ consider developing a streamlined pre-review process for projects that would involve a significant number of applications.

The commission did not make changes as a result of this comment. The TCEQ may receive over 1,500 applications during each grant application period and must review those applications within a very short period of time in order to award the grant funding before the deadline for obligating appropriated state funds. The volume of applications that must be processed and reviewed makes it infeasible to consider an additional application pre-review process.

Clean Energy recommended that the guidelines be revised to make it clear that grant funding may be used for labor to install emissions-reducing equipment.

The commission did not make any changes in response to this comment. The guidelines prohibit administrative costs, including in-house labor costs, from reimbursement under a grant. Installation costs billed by a contractor or vendor are allowed in the guidelines. The restrictions on administrative costs and in-house labor were established to ensure that grant recipients did not receive a direct financial benefit from the grant. In addition, tracking and reporting on in-house salaries, benefits, and indirect costs adds a significant administrative burden on the grant recipient and the TCEQ. Also, the installation of engines or retrofit devices must be in accordance with manufacturer requirements and meet all warranty provisions, making in-house installation of engines or retrofit devices infeasible in many cases.

Clean Energy recommended that projects involving fleets that travel between nonattainment areas and near-nonattainment areas be given the same competitive consideration as projects that operate only within the nonattainment areas.

The commission did not make any changes in response to this comment. Texas Health and Safety Code, §386.105(d) requires that only the emissions reductions achieved in the nonattainment counties and other affected counties may be used to determine the cost-effectiveness of a project. In addition, only emissions reductions that are achieved in the nonattainment areas may be applied to the SIP.

Clean Energy recommended that the commissioners delegate the authority to revise the guidelines to the executive director and grant the executive director the discretion to accept alternative means of complying with the performance standards and criteria in the guidelines.

The commission did not make any changes in response to this comment. Where appropriate, the guidelines provide the executive director with authority to consider alternative approaches and deviations from standard requirements. However, Texas Health and Safety Code, §386.053(a) requires the commission to adopt revisions to the guidelines, after receiving input and public comment on the proposed changes. The statute does not provide for delegation of the adoption authority.

NREC recommended that the maximum cost-effectiveness for locomotive projects be increased from $5,000 per ton of NO_x reduced. NREC commented that increasing the cost-effectiveness to the maximum allowed of $15,000 per ton would open up more opportunities for operators of railroad equipment and help the state and surrounding communities achieve their goal of reduced emissions for years to come.

The commission did not make any changes to the guidelines as a result of this comment. The cost-effectiveness limits are set on a grant-round basis, within the requirements that projects may not exceed $15,000 per ton and that locomotive and marine projects have a lower cost-effectiveness limit than other projects. The commission will consider NREC's comments when determining the cost-effectiveness limits to set for future grant rounds.

One individual recommended that the TCEQ reinstate the option of allowing TERP grantees to sell/transport contracted vehicles/equipment to countries outside the United States. This individual also recommended that the TCEQ take physical possession of units to be salvaged so that the TCEQ could more fully oversee the destruction and salvage process. The individual expressed concern that the TCEQ relies on the private salvage industry to take possession of the replaced units, without a direct binding contract with the salvage company.

The commission did not make any changes based on these comments. The requirement for destruction instead of transfer out-of-state is to ensure that the vehicles and equipment being replaced are no longer used in Texas and are removed from the national inventory as well. Under the transfer option, the TCEQ has no viable and reasonable mechanism to ensure that those units are not brought back into Texas. Regarding the comments on who is responsible for destruction of the old vehicle or equipment, it would not be feasible for the TCEQ to take control of the old vehicles and equipment to ensure destruction. As part of the grant contract conditions, the grant recipient is responsible for compliance with the destruction requirements.

SARA recommended that Rebate Program applications should not be rejected due to an error in the application form and that the worthiness of the project should be more important.

The commission did not make any changes in response to this comment. The rebate grants program is established to provide a faster process. A key difference from the other grant programs is that the signed application becomes the grant contract when counter-signed by the TCEQ-authorized official. Because the application forms become the contract, the TCEQ is not able to make corrections to the forms after submission of the application. Therefore, if the application has errors, it must be returned to the applicant to correct the errors and submit a new, signed application. The commission will continue to consider ways to simplify the rebate grants process.

One individual recommended that the TCEQ provide grants for the full replacement cost of vehicles and or equipment.

The commission did not make any changes in response to this comment. The replacement grant category has had very good participation from vehicle and equipment owners under the current requirements that a grant cover no more than 80 percent of the replacement costs. Requiring some financial participation by the applicant helps to ensure that prices are not inflated and that the applicant is committed to making the program work.

ICF recommended that the Replacement project category include a 12-month retroactive period similar to the other grant categories. ICF commented that many businesses cannot afford to wait on the next TERP application period to replace older equipment.

The commission did not make any changes in response to this comment. In order to consider the emissions reductions from a replacement project as valid, the commission must determine that the equipment being replaced would have otherwise continued to be used, absent the award of a grant. If the new equipment has already been purchased before the grant application period opens, the commission would not be able to make this determination.

EM recommended that the TCEQ find ways to include more on-road medium-duty vehicles in the program. EM commented that these vehicles have traditionally been underrepresented in the program because of lower mileage. EM further commented that these vehicles are operating in urban areas at lower speeds, so the pollution that they are emitting may disproportionately impact public health. EM suggested adjusting the default miles for rebate grants or adjusting the cost-per-ton limits to encourage greater participation.

The commission did not make any changes in response to this comment. The goal of the TERP program is to achieve the greatest amount of NO_x emissions reductions for the least amount of money, especially considering the limited funding. Larger vehicles with greater annual mileage emit more NO_x than smaller vehicles with limited annual mileage. As a result, projects to replace or upgrade larger vehicles generally have a better cost per ton of NO_x reduced than projects involving smaller vehicles and qualify for a greater percentage of the costs for replacement or upgrade. The commission will continue to put a priority on funding the most cost-effective projects.

EM recommended revisions to the Rebate Grant applicant form. EM's suggestions included adding page numbers on every page and requiring an initial for the applicant on each page required to be submitted.

The commission will consider these recommendations when developing future application forms.

EM commented that there is some confusion regarding the non-road equipment categories eligible under the Rebate Grants program, including the definition of an "off-road truck" and other categories.

The commission will consider this recommendation when developing new application forms and application instructions.

EM recommended that the TCEQ report both the grant amount requested and grant amount approved during open rebate grant application periods. EM commented that listing only the grant amount remaining does not indicate the rate at which the money is being spent.

The commission will consider these recommendations for future rebate grant application periods. However, the volume of applications received and processed within a very short period of time makes it difficult to provide quick updates on the status of the funding.

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Draft for Commission Approval
March 2010

Texas Emissions Reduction Plan: Guidelines for Emissions Reduction Incentive Grants

Air Quality Division

printed on
recycled paper

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Texas Emissions Reduction Plan: Guidelines for Emissions Reduction Incentive Grants

Prepared by
Air Quality Division

RG-388
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March 2010

Added or Revised Sections are Highlighted

Page to be added in final publication

Contents

Chapter 1
Summary

These guidelines contain the criteria for grants under the Texas Emissions Reduction Plan (TERP), authorized under Chapter 386, Subchapter C of the Texas Health and Safety Code. The Texas Commission on Environmental Quality (TCEQ) has adopted rules to implement this program under Title 30, Texas Administrative Code (30 TAC), Chapter 114, Subchapter K.

Purpose

This program was established by the Texas Legislature to create monetary incentives for projects to improve air quality in the state's nonattainment areas. These areas have been determined not to meet certain air quality standards established by the U.S. Environmental Protection Agency (EPA). Other eligible counties of the state that may face air quality challenges in the future are also eligible for incentives under this program.

Activities eligible for funding under this program are intended to reduce the emissions of nitrogen oxides (NO_X). NO_X is usually a by-product of high-temperature combustion. Everyday functions like driving a motor vehicle or operating heavy equipment contribute to the creation of NO_X. It reacts with volatile organic compounds (VOC) in the presence of sunlight to form harmful ground-level ozone.

As required under the statute, these guidelines establish the standards and criteria for grants issued under the TERP. Along with the statutory and regulatory provisions applicable to this program, recipients of incentive funding must adhere to the criteria set forth in these guidelines.

The TCEQ may also establish more specific criteria, through contracts or other funding mechanisms, consistent with these guidelines.

Funding

This program is funded through revenue deposited into the Texas Emissions Reduction Plan Fund. That revenue consists of fees and surcharges established by the Texas Legislature.

The amount of funds available for grants during each year may vary depending on the cash flow to the program and the amount of revenues received, as well as legislative appropriations to the program. The TCEQ will periodically issue notices and information regarding the grant programs, including information on the amount of funds available.

Grant-Program Descriptions

Several grant programs are administered through the TERP:

Emissions Reduction Incentive Grants Program. Authorized in Texas Health and Safety Code 386.102, this program awards grants to cover the incremental costs of projects in the state's 41 air quality nonattainment and near-nonattainment counties.

Rebate Grants Program. Texas Health and Safety Code 386.117 directs the TCEQ to award rebate grants in order to streamline grant applications, contracting, reimbursement, and reporting for project categories designated by the TCEQ.

Small-Business Grants Program. Per Texas Health and Safety Code 386.116, businesses that own and operate one or two vehicles or pieces of equipment—one of which must be diesel-powered and a pre–1994 model vehicle—or pieces of non-road equipment with "uncontrolled emissions" are considered small businesses. This program is intended to afford these small businesses greater opportunities to participate in the emissions-reduction incentive programs.

Third-Party Grants Program. Texas Health and Safety Code 385.103(a) authorizes the TCEQ to allow a person other than the owner to apply for and receive a grant in order to improve the ability of the program to achieve its goals.

Particulate Matter Reduction Retrofits Grants Program. Texas Health and Safety Code 386.053(d) authorizes adding pollutants in order to improve the ability of the plan to achieve its goals. Accordingly, funding shall be made available for retrofit or add-on technologies to achieve the reduction of particulate-matter emissions from school buses.

Grant funding levels for activities of these types have been developed consistent with the TCEQ Clean School Bus program. Funding determinations were a result of TCEQ analysis of the cost and relative effectiveness of available retrofit technology to reduce PM. Projects are limited to retrofit activities located in the eligible counties and specifically identified and approved by the TCEQ. Funding for these activities shall be awarded consistent with the provisions of Texas Health and Safety Code Chapter 390 and 30 Texas Administrative Code (TAC) 114.640–48.

How to Contact Us

For information about the grant programs, interested parties should check the TERP Web site at <www.terpgrants.org>. Also linked from that page are electronic versions of this document, the technical supplements to the guidelines, and the application forms, as well as other information that may be helpful to a potential applicant.

Staffers at the TCEQ are available to answer questions and offer assistance with the grant programs. If you are unclear about whether a proposed project would qualify for a grant, please feel free to contact TCEQ personnel to discuss the project.

Program staffers may be reached by calling 800-919-TERP (8377) between 8:00 a.m. and 5:00 p.m., Monday–Friday, by e-mail at <terp@tceq.state.tx.us>, or by mail at:

Implementation Grants Section, MC 204
Air Quality Division
Texas Commission on Environmental Quality
P.O. Box 13087
Austin, TX 78711-308

Chapter 2
Glossary

Terms as they are defined in Texas Health and Safety Code, Chapter 386, and the TCEQ rules (30 TAC 114.620) apply to this program, except as such terms are further defined and have the meanings as explained below.

activity Each individual purchase or lease, replacement, repower, retrofit of an on-road vehicle, non-road piece of equipment, locomotive, marine vessel, or stationary equipment. An activity also includes each purchase of on-vehicle infrastructure, on-site infrastructure, or qualifying fuel as may be specifically grouped as an activity by the TCEQ in the application forms and approved under a grant contract.

activity life The period used to determine the emissions reductions and cost-effectiveness of the activity. The minimum activity life for most projects is five years, although a longer minimum activity life may be established by the TCEQ for a particular grant application period. The TCEQ will establish a start date for each type of activity. For replacement and repower projects the start of the activity life will usually be once the TCEQ verifies that proper disposal of the vehicle, equipment, and/or engine has occurred.

cost-effectiveness The total dollar amount expended divided by the total number of tons of reduced emissions of nitrogen oxides attributable to that expenditure. In calculating cost-effectiveness, one-time grants of money are annualized using a time value of public funds or discount rate determined for each project by the TCEQ, taking into account the interest rate on bonds, interest earned by state funds, and other factors the TCEQ considers appropriate. The current discount rate used to determine cost-effectiveness is 3 percent per year.

incremental cost The cost of an applicant's project, less a baseline cost that would otherwise be incurred by an applicant in the normal course of business. It may include added lease or fuel costs, as well as additional capital costs.

motor vehicle A self-propelled device designed for transporting persons or property on a public highway that is required to be registered under Texas Transportation Code Chapter 502.

non-road equipment A piece of equipment, excluding a motor vehicle or on-road heavy-duty vehicle, that is powered by a non-road engine, including non-road and non-recreational equipment and vehicles; construction equipment; industrial equipment; mining equipment; locomotives; marine vessels; and other high-emitting engine categories.

non-road engine An internal combustion engine that is in or on a piece of equipment that is self-propelled or that propels itself and performs another function, excluding a vehicle that is used solely for competition, a piece of equipment that is intended to be propelled while performing its function, or a piece of equipment designed to be capable of being carried or moved from one location or another. In general, an engine that will stay at a single site for at least a full year will be considered a stationary engine, rather than a non-road engine. The TCEQ will make the final determination of the type of engine.

on-road heavy-duty vehicle An on-road motor vehicle that has a gross vehicle weight rating of 8,500 pounds or more.

person An individual, corporation, organization, government or governmental subdivision or agency, business trust, partnership, association, or any other legal entity. This may include a corporation headquartered outside Texas that operates equipment or vehicles primarily in an eligible county in Texas.

project One or more activities approved by the TCEQ under one grant contract.

qualifying fuel Any liquid or gaseous fuel or additive that is ultimately dispensed into a motor vehicle, on-road heavy-duty vehicle, non-road equipment, or a stationary engine that reduces emissions of nitrogen oxides, as determined by the TCEQ, beyond reductions required by state or federal law.

repower To replace an old engine with a new engine, a used engine, a remanufactured engine, or one or more electric motors, drives, or fuel cells.

retrofit To equip an engine, a fuel system, or both with new emissions-reducing parts or technology after the manufacture of the original engine or fuel system.

stationary engine A machine used in non-mobile applications that converts fuel into mechanical motion, including turbines and other internal combustion devices. In general, a stationary engine is used either in a fixed application or in a portable (i.e., transportable) application in which it will stay at a single site for at least a full year (12 consecutive months). The TCEQ will make the final determination of the type of engine.

Uniform Grant Management Standards (UGMS) Standards issued by the Office of the Governor for use by state agencies in issuing and administering grants under the authority provided in the Uniform Grant and Contract Management

Act, Texas Government Code, Section 783.001 et seq., and the Uniform Grant and Contract Management Standards for State Agencies, 1 TAC § 5.141 et seq.

Chapter 3
Eligible Areas

The counties eligible under this program (eligible counties) include those counties within the nonattainment areas designated under the Federal Clean Air Act, 107(d), as well as other counties identified as "Affected Counties" in Texas Health and Safety Code 386.001(2) and TCEQ rules (30 TAC 114.629). The 41 eligible counties currently located within a nonattainment area or designated as affected are listed in Table 3.1 (see also map, Figure 3.1). While this list is accurate as of the time of publication, eligible counties and the boundaries of nonattainment areas may be subject to change.

Table 3.1
Counties in Texas Eligible for the TERP Program

Bastrop	Fort Bend	Hunt	Rusk
Bexar	Galveston	Jefferson	San Patricio
Brazoria	Gregg	Johnson	Smith
Caldwell	Guadalupe	Kaufman	Tarrant
Chambers	Hardin	Liberty	Travis
Collin	Harris	Montgomery	Upshur
Comal	Harrison	Nueces	Victoria
Dallas	Hays	Orange	Waller
Denton	Henderson	Parker	Williamson
Ellis	Hood	Rockwall	Wilson
El Paso			

The TCEQ may limit funding under a grant period to projects in only some of the eligible counties based on the funding allocation decisions for that period.

The TCEQ may also designate highways and roadways, or portions of highways and roadways, to count towards requirements outlined later in these guidelines that at least 75 percent of the miles driven by grant-funded on-road vehicles be in the eligible counties. Usage outside of the TERP eligible counties will not count towards emissions reductions used to determine the cost-effectiveness of the project.

The following are portions of highways that are designated for travel by grant-funded on-road vehicles to meet the 75 percent usage requirement:

- Interstate Highway 10 from the Texas–New Mexico border to the Texas-Louisiana border,
- IH 20 from Interstate Highway 10 to the Texas-Louisiana border,

- IH 30 from the Rockwall County to the Texas-Arkansas border,
- IH 35 from the Texas-Mexico border to the Texas-Oklahoma border,
- IH 37 from the Gulf of Mexico to Bexar County,
- IH 45 from the Montgomery County to Ellis County,
- U.S. Highway 59 from the Texas-Mexico border to the Texas-Arkansas border,
- US 79 from Williamson County to the Texas-Louisiana border,
- US 281 from the Texas-Mexico border to the Texas-Oklahoma border,
- US 77 from the Texas-Mexico border to Ellis County, and
- US 290 from IH 10 to Waller County.

(See also Figure 3.2.)

The TCEQ may limit the funding under a grant period to only some of these highways based on allocation decisions for that period.

Figure 3.1
TERP Eligible Counties (subject to change)

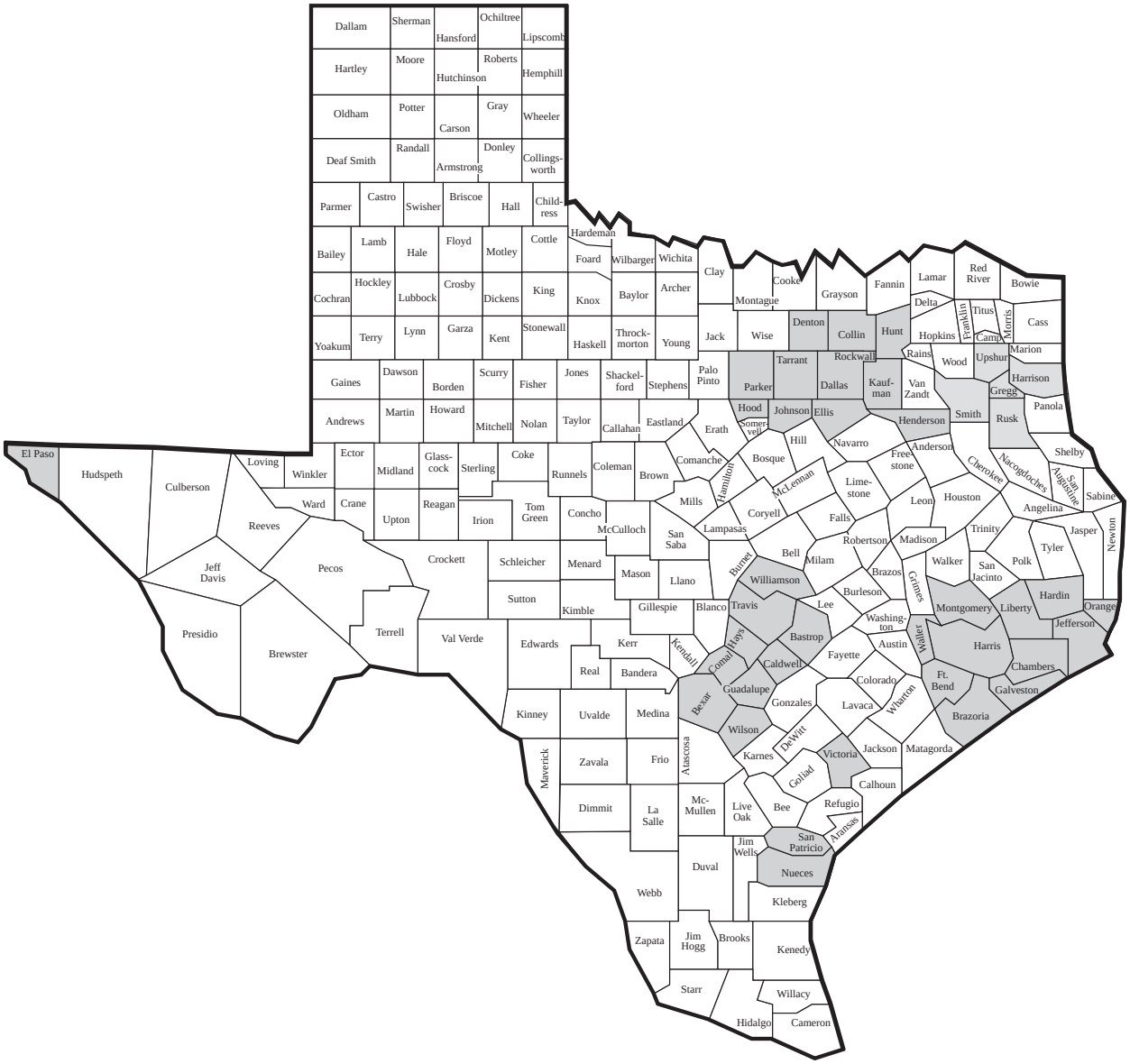
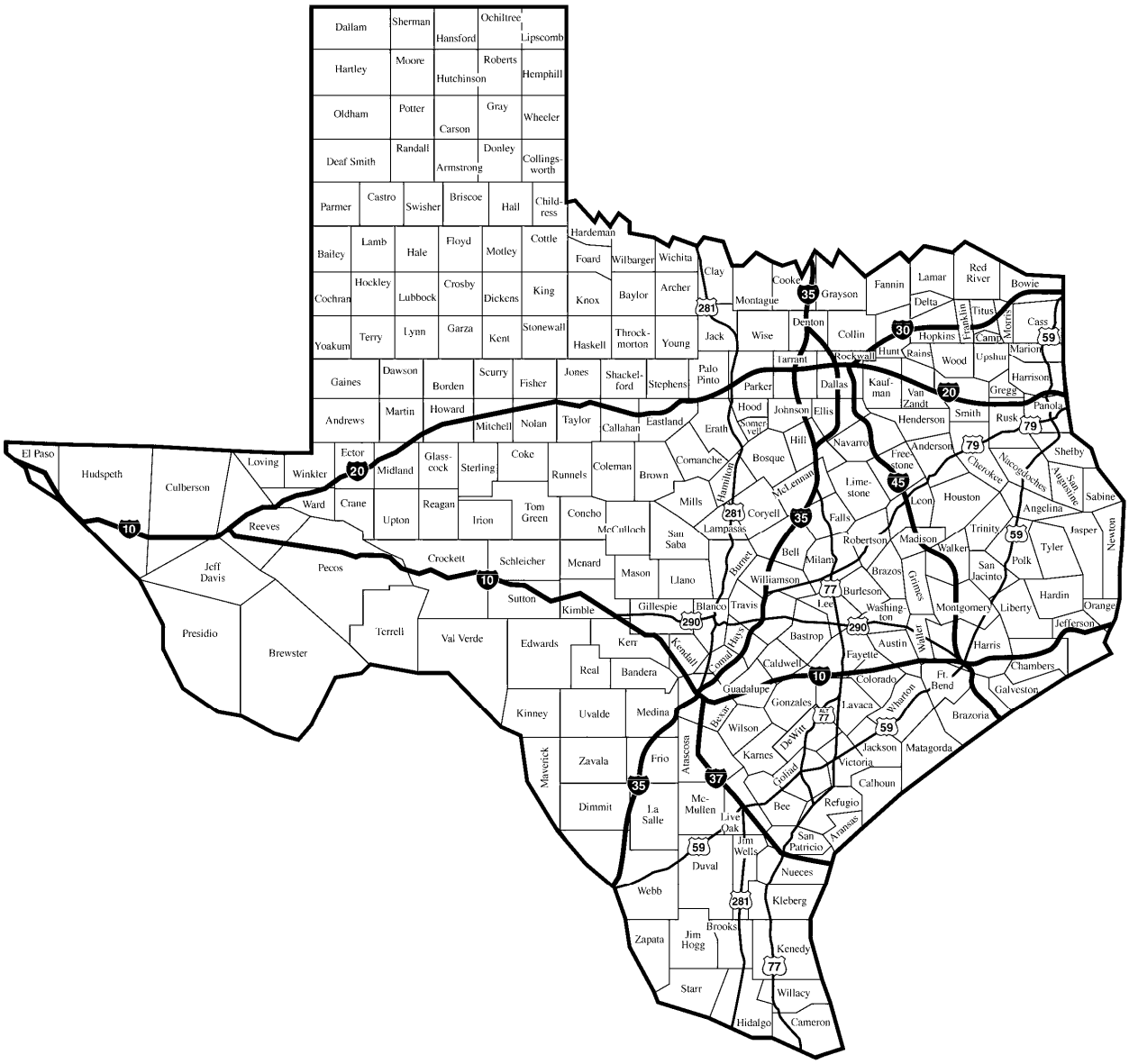


Figure 3.2
TERP Designated Highways and Roadways (subject to change)



Chapter 4
Emissions Reduction Incentive Grants Program

The Emissions Reduction Incentive Grants (ERIG) program awards grants to fund the incremental costs of projects in the eligible counties.

Activities that may be eligible under this program are outlined below. Vehicles and equipment used primarily for competition or recreation are not eligible for funding under any of the project categories. The TCEQ may more narrowly define or limit the types of eligible activities for a particular funding period.

Eligible Applicants

Applicants are potentially eligible for incentive funding if they operate or plan to operate on-road heavy-duty vehicles, non-road equipment, marine vessels, locomotives, or stationary engines primarily in one or more of the eligible counties, or if they otherwise contribute to NO_X emissions in the eligible counties.

For infrastructure activities (see Appendixes 6–8) persons owning and operating the infrastructure in an eligible county may also be eligible for funding. For demonstration projects, persons may be eligible for funding if they own the technology to be demonstrated in an eligible county, or if they own the vehicles or equipment on which the technology will be demonstrated.

For particular funding periods, the TCEQ may limit eligibility to certain types of applicants. The TCEQ may also allow a person other than the owner or operator of the vehicle or equipment to apply for and receive a grant, as long as the grant-funded project supports activities that meet these guidelines and will help to achieve the goals of the TERP.

Eligible Activities

Activities eligible for incentive funding are intended to reduce NO_X emissions in the designated eligible counties from on-road heavy-duty vehicles, non-road equipment, marine vessels, locomotives, or stationary engines when compared with a baseline vehicle or piece of equipment. Additional information and criteria on eligible activities and costs are available in the appendixes to this volume.

Most of the engines eligible under this program will be powered by diesel-fueled compression-ignition engines. However, engines powered by other fuels may also be eligible, subject to decisions by the TCEQ for particular funding periods and geographic areas.

The TCEQ may further limit the types of eligible activities, and may more narrowly define eligibility requirements under a particular funding period, as needed to best achieve the goals of the TERP.

On-Road Heavy-Duty Vehicles

On-road heavy-duty vehicles with a gross vehicle weight rating of 8,500 pounds or more are eligible for grants under this program. Activities and eligible costs are explained in Appendix 1. Eligible activities include:

- lease or purchase of new on-road vehicles (fleet expansion),
- replacement of on-road vehicles,
- repower of on-road vehicles, and
- retrofit or add-on of emissions-reduction technology.

Non-Road Heavy-Duty Equipment

Non-road equipment powered by an engine rated at 25 horsepower or greater is eligible for grants under this program. For replacement and repower projects, this requirement refers to the horsepower of the engine being replaced and does not apply to the replacement engine or technology. Activities and eligible costs are explained in Appendix 2. Eligible activities include:

- lease or purchase of new non-road vehicles (fleet expansion),
- replacement of non-road vehicles,
- repower of non-road vehicles, and
- retrofit or add-on of emissions-reduction technology.

Marine Vessels

Marine vessels powered by engines of at least 25 hp, and associated auxiliary marine engines of at least 25 hp, are eligible for grants under this program. For replacement and repower projects, the requirement refers to the horsepower of the engine being replaced and does not apply to the replacement engine or technology. Activities and eligible costs are explained in Appendix 3. Eligible activities include:

- lease or purchase of new marine vessels (fleet expansion),
- replacement of marine vessels,
- repower of marine vessels, and
- retrofit or add-on of emissions-reduction technology.

Locomotives

Locomotives are eligible projects under this grant program. Activities and eligible costs are explained in Appendix 4. Eligible activities include:

- lease or purchase of new locomotives (fleet expansion),
- replacement of locomotives,
- repower of locomotives, and
- retrofit or add-on of emissions-reduction technology.

Stationary Equipment

Activities involving stationary engines of at least 25 hp are eligible for grants under this program. For replacement and repower projects, this requirement refers to the horsepower of the engine being replaced and does not apply to the replacement engine or technology.

An activity is not eligible if the activities or emissions reductions to be funded are already required by any state or federal law, rule, regulation, memorandum of agreement, or other legally binding document. In addition, any emissions reduction credits generated by a project must be transferred to the state for the State Implementation Plan, and permanently retired.

Activities and eligible costs are explained in Appendix 5. Eligible activities include:

- lease or purchase of new stationary equipment (fleet expansion),
- replacement of stationary equipment,
- repower of stationary equipment, and
- retrofit or add-on of emissions-reduction technology.

Refueling Infrastructure

An eligible activity may include the purchase and installation of stationary or mobile on-site infrastructure for refueling motor vehicles, on-road heavy-duty vehicles, non-road equipment, marine vessels, locomotives, and stationary

engines with a qualifying liquid or gaseous fuel. In some cases, the TCEQ may accept applications for refueling infrastructure related to stationary equipment. The applicant will need to supply proof that the infrastructure is needed and will be used in an eligible county.

A qualifying fuel is a liquid or gaseous fuel or additive that is ultimately dispensed into a motor vehicle, an on-road heavy-duty vehicle, non-road equipment, a locomotive, a marine vessel, or a stationary engine and reduces NO_X emissions, as determined by the TCEQ, beyond reductions required by state or federal law.

Activities and eligible costs are explained in Appendix 6.

On-Site Electrification and Idle Reduction Infrastructure

An eligible activity may include the purchase and installation of on-site infrastructure—including auxiliary power units—designed to dispense electricity to motor vehicles, on-road heavy-duty vehicles, non-road equipment, marine vessels, locomotives, and stationary engines. The electricity may replace the power normally supplied by the engine while the vehicle or equipment is parked (idle reduction) or may recharge electric vehicles or equipment being used in lieu of vehicles or equipment powered by an internal combustion engine. The applicant will need to supply proof that the infrastructure is needed and will be used in an eligible county.

The TCEQ may also tender funds to other state agencies to implement infrastructure projects at rest areas and other public facilities on major highway transportation routes within eligible areas. Projects may also be funded for marine vessels operating in eligible waterways. Funding may be used for initial start-up and proper operation of the idle reduction technologies.

Activities and eligible costs are explained in Appendix 7.

On-Vehicle Electrification and Idle Reduction Infrastructure

An eligible activity may include the purchase and installation of equipment that enables an on-road vehicle, non-road equipment, marine vessel, locomotive, or stationary engine to use electric power to operate, while the vehicle or equipment is parked, the systems normally supplied power by the propulsion engine or another on-board internal combustion engine that emits NO_X.

Activities and eligible costs are explained in Appendix 8. Eligible equipment may include:

- devices added on to enable acceptance of electricity from an external power source, and

- an auxiliary power unit purchased and installed on the vehicle or equipment to generate electricity.

Activities and eligible costs are explained in Appendix 8.

Rail Relocation and Improvements

Eligible activities may include rail line relocation and improvements at rail intersections that will result in the reduction in emissions of NO_X by reducing locomotive idle time at those intersections.

Activities and eligible costs are explained in Appendix 9.

Use of Qualifying Fuel

The incremental costs associated with the purchase and use of a qualifying fuel or fuel additive in a motor vehicle, an on-road heavy-duty vehicle, non-road equipment, a marine vessel, a locomotive, or a stationary engine may be eligible for funding under this program. The incremental cost is the difference in cost between the qualifying fuel and a baseline fuel. For the purchase of fuel additives, the incremental costs include the full cost of the additive.

To determine an incremental cost for fuel purchases, the cost per gallon of the baseline fuel should be compared with the cost for an equivalent amount of the qualifying fuel. Equivalency between the qualifying fuel and the baseline fuel should be determined based on the energy content of the fuel, as measured by the use per mile or hour, or other method.

Activities and eligible costs are explained in Appendix 10.

Demonstration of New Technology

Projects under this category must demonstrate practical low-emissions retrofit technologies, repower options, and advanced technologies for on-road heavy-duty diesel vehicles and diesel-powered non-road equipment. Projects under this category may include:

- use of retrofit, repower, and add-on technologies to reduce NO_X emissions from the existing stock of heavy-duty diesel vehicles and non-road diesel equipment, and
- use of advanced technologies, including use of qualifying fuels, for new engines and vehicles that produce very-low or zero emissions of NO_X—including stationary and mobile fuel cells—which could replace the use of higher-emitting diesels.

Activities and eligible costs are explained in Appendix 11.

Grant Program Procedures

This section contains the general procedures that will be used for the application, awarding, and administration of grants under this program. The TCEQ may adjust these procedures and develop more detailed procedures, as needed, to ensure the effectiveness of the program.

Project Solicitation

Grant projects will be solicited through periodic or open-ended Requests for Applications (RFAs) and through other mechanisms to solicit grant applications. Copies of the RFAs and the necessary application forms are made available at the TERP Web site <www.terpgrants.org> and directly from the TCEQ.

Application Review and Selection

The program will review and evaluate grant applications according to criteria established in these guidelines and the RFAs. When it uses a competitive process, the agency will select among projects using ranking and scoring procedures explained in the RFAs. In general, the selection priorities may include allocation of the funding among a subset of the eligible counties, as well as allocation among the various types of project categories. Grants may also be selected in the order received or by another mechanism.

The TCEQ may also establish a cost-effectiveness threshold for particular funding periods and geographic areas.

Application Verification Visits

Upon receipt of a grant application, the TCEQ may check the vehicle and equipment for condition, engine identification, and vehicle identification.

Awarding of Grants and Contracting

Projects selected for funding will be awarded a grant through the development and execution of a grant contract that is signed by the recipient and by an official of the TCEQ. Grant contracts may contain additional and more specific

requirements than those contained in these guidelines. Grant recipients should review the contract's language carefully before accepting and signing it.

Because the funding for this program comes from revenue that is received throughout the year, all grant awards and contracts will be contingent upon the receipt of sufficient revenue to cover the grant. Grant contracts may be issued on a contingency basis, subject to a follow-up Notice to Proceed being issued by the TCEQ, once sufficient funds are available.

Reimbursement

Grant payments will be reimbursements, meaning that the agency will remit payment **after** the eligible expense has been incurred by the recipient. Recipients will also have the option to assign their grant payments directly to a dealer or service provider. The TCEQ will supply reimbursement request and reporting forms for use by the recipient.

In some cases, particularly for large projects and projects of long duration, the TCEQ may also authorize advance payments, based on a percentage of the expected final costs. The grant contract and the reimbursement forms will include requirements for documentation of expenses.

Upon completion of all grant-funded purchases, the grant recipient will need to submit a final request for reimbursement of all remaining expenses. The final request must include a completed and signed release of claims.

The grant recipient must also agree to place a label or sticker on the grant-funded vehicles and equipment, as may be supplied by the TCEQ.

Vehicle, Equipment, and Engine Disposition Verification

The applicant must agree to destroy the old vehicle or equipment (including the engine) within 90 days of receiving reimbursement by the TCEQ, provided, however, that for a locomotive project the executive director may allow permanent removal from the Texas in specific grants where the applicant has furnished adequate assurances that the old locomotive will not be returned to Texas.

Except where the executive director has authorized an alternative disposition plan for a locomotive project, a hole—large enough to prevent repairs (usually at least 3 inches in diameter)—will need to be drilled through the engine block, and the frame rails will need to be cut so that repairs are not possible. The applicant must certify the disposition of the old vehicle using forms supplied by the TCEQ. The TCEQ may require a certified or duplicate Texas Salvage Vehicle Title or Nonrepairable Vehicle Title as evidence that the vehicle has been

scrapped. Grantees may be required to return grant funds if they fail to meet the disposition requirements.

If an alternative disposition plan is approved for a locomotive project, its details will be included in the grant contract and the grant recipient must commit to implementing the provisions as set forth in the contract. If the provisions of the alternative disposition plan are not met, the recipient must then either destroy the old locomotive, as stated above, or the agency may require the grant recipient to return funds.

Monitoring and Reporting

The grant recipient must agree to monitor and track the use of grant-funded vehicles, equipment, infrastructure, and qualifying fuel for the activity life designated in the grant contract. The activity life is used to determine the total reductions in NO_X emissions and cost-effectiveness of the activities and the project.

Monitoring reports must be submitted to the TCEQ twice a year; they will document the usage over the required reporting period. The TCEQ may require applicants to use global positioning system units to monitor grant-funded equipment or allow voluntary use of a GPS unit in lieu of filing the required reports. All applicants monitoring via GPS will be required to use a vendor selected by the TCEQ.

If an alternative disposition plan is approved for a locomotive project, the grant recipient must agree to monitor and track the location of the old locomotive to ensure that it is not returned to Texas. The grant recipient must also agree to provide the TCEQ with the monitoring information, upon request. The grant recipient must notify the TCEQ immediately if the use of the locomotive, including where it is used, deviates from any approved alternative disposition plan.

Emissions Reduction Commitment

Over the activity life of each grant-funded activity, the grant recipient commits the generated emissions reductions to the State Implementation Plan. The recipient is responsible for performing the activities, as defined in the contract, necessary to achieve [achieving] the calculated NO_X emissions reductions within the eligible areas. Except in circumstances where the TCEQ determines that the intent of the program has been met, recipients [Recipients] will be required to return all or a pro rata share of the grant funds to the TCEQ if the emissions reductions over the activity life are not achieved.

In determining whether the intent of the program has been met, the TCEQ may consider the good-faith efforts of the grant recipient to meet the usage commitments originally projected. The TCEQ may consider circumstances that adversely impacted the ability of the recipient to use the grant-funded vehicle or equipment, such as major natural disasters and other factors not under the control of the grant recipient.

The TCEQ may include an annual NO_x emissions reduction commitment in the contract, where appropriate. At its discretion, the TCEQ may require the return of all or a pro rata share of grant funds if the annual emission reductions are not being achieved. The decision on whether to require return of all or a pro rata share of the grant funds may be based on, but is not limited to, an assessment of whether the annual performance is so low that it is unlikely that the grant recipient will be able to achieve the emissions reductions committed to over the activity life. The TCEQ may also use annual emissions reduction commitments to ensure that a grant recipient does not overachieve the emissions reductions during the first years of the activity life in order to underachieve the emissions reductions in later years.

The emissions reduction calculations are based on a usage amount (miles, hours, or fuel use) over the activity life. The TCEQ may require a usage commitment by the grant recipient or, alternatively, the TCEQ may establish default usage amounts either on a project category basis or for individual types of vehicles or equipment. Where a usage commitment is required, grant recipients must agree to operate the grant-funded vehicles or equipment in the eligible counties for the usage amounts committed to in the contract.

The TCEQ may work with the grantee to implement other options for ensuring that the emissions reduction commitments will be achieved before a return of grant funds is required. If the TCEQ requires the return of a pro rata share of the grant funds for underachievement of the annual emissions reduction commitment, the TCEQ may revise the commitment over the remaining activity life to a lower amount, based on a new projection of the emissions reductions.

Except where a percentage of use commitment is not required for that type of project, grant recipients must also agree to operate the grant-funded vehicle or equipment in the eligible counties for a minimum percentage of the annual and/or total usage. Except in circumstances where the TCEQ determines that the intent of the program has been met, the recipient will be required to return all or a pro rata share of the grant funds to the TCEQ if the percentage of use commitment is not met. The TCEQ may work with the grantee to implement other options for ensuring that a percentage of use commitment will be met before a return of grant funds is required.

Chapter 5
Rebate Grants Program

The Rebate Grants Program awards grants to fund the incremental costs of projects in the eligible counties.

Activities that may be eligible under this program are outlined below. Vehicles and equipment used primarily for competition or recreation are not eligible for funding under any of the project categories. The TCEQ may more narrowly define or limit the types of eligible activities for a particular funding period. The TCEQ may also establish more than one rebate-grants program to include various emission-source categories and types of projects, such as replacements, repowers, and retrofits.

Eligible Applicants

Applicants are potentially eligible for incentive funding if they operate or plan to operate on-road heavy-duty vehicles, non-road equipment, marine vessels, locomotives, or stationary engines primarily in one or more of the eligible counties, or if they otherwise contribute to NO_X emissions in the eligible counties.

For particular funding periods, the TCEQ may limit eligibility to certain types of applicants. The TCEQ may also allow a person other than the owner or operator of the vehicle or equipment to apply for and receive a grant, as long as the grant-funded project supports activities that meet these guidelines and will help to achieve the goals of the TERP.

Eligible Activities

Activities eligible for rebate grants are intended to reduce NO_X emissions in the designated eligible counties from on-road heavy-duty vehicles, non-road equipment, marine vessels, locomotives, or stationary engines.

Most of the engines eligible under this program will be powered by diesel-fueled compression-ignition engines. However, engines powered by other fuels may also be eligible, subject to decisions by the TCEQ for particular funding periods and geographic areas.

All project categories and types of activities, such as replacements, repowers, and retrofits, listed under the Emissions Reduction Incentive Grants program in Chapter 4 of these guidelines may be eligible for funding in the Rebate Grants program. The TCEQ may limit the types of activities that may be funded under a rebate grant for particular funding periods.

The TCEQ may establish default usage rates to determine the rebate grant amounts. The TCEQ may also establish a minimum average annual usage amount for vehicles and equipment being replaced under a rebate grant.

Grant Program Procedures

This section contains the general procedures that will be used for the application, awarding, and administration of grants under this program. The TCEQ may adjust these procedures and develop more detailed procedures, as needed, to ensure the effectiveness of the program.

Project Solicitation

The agency will solicit project grants through periodic or open-ended Notices of Rebate Grants (NRGs) and through other processes. Copies of NRGs and the necessary application forms will be made available at the TERP Web site <www.terpgrants.org> and directly from the TCEQ.

The TCEQ may establish a cost-effectiveness threshold for particular funding periods and geographic areas.

Application Review and Selection

Grant applications will be reviewed and evaluated according to criteria established in these guidelines and the NRGs. In general, the selection priorities may include allocation of the funding among a subset of the eligible counties, as well as allocation among the various types of project categories.

The agency will review applications for rebate grants in the order received and will fund projects as money becomes available.

Application Verification Visits

Upon receipt of a grant application, the TCEQ may check any vehicles and equipment for condition, engine identification, and vehicle identification number.

Awarding of Grants and Contracting

Projects selected for funding will be awarded a grant through the development and execution of a grant contract that is signed by the recipient and by an official of the TCEQ. Grant contracts may contain additional and more specific requirements than those contained in these guidelines. Grant recipients should review the contract's language carefully before accepting and signing it.

Because the funding for this program comes from revenue that is received throughout the year, all grant awards and contracts will be contingent upon the receipt of sufficient revenue to cover the grant.

Reimbursement

Grant payments will be reimbursements, meaning that the agency will remit payment **after** the eligible expense has been incurred by the recipient. Recipients will also have the option to assign their grant payments directly to a dealer or service provider. The TCEQ will supply reimbursement request and reporting forms for use by the recipient.

In some cases, particularly for large projects and projects of long duration, the TCEQ may also authorize advance payments, based on a percentage of the expected final costs. The grant contract and the reimbursement forms will include requirements for documentation of expenses.

Upon completion of all grant-funded purchases, the grant recipient will need to submit a final request for reimbursement of all remaining unreimbursed expenses. The final request must include a completed and signed release of claims.

The grant recipient must also agree to place a label or sticker on the grant-funded vehicles and equipment, as may be supplied by the TCEQ.

Vehicle, Equipment, and Engine Disposition Verification

The applicant must agree to destroy the old vehicle or equipment (including the engine) within 90 days of receiving reimbursement by the TCEQ, provided,

however, that for a locomotive project the executive director may allow permanent removal from Texas in specific grants where the applicant has furnished adequate assurances that the old locomotive will not be returned to Texas.

Except where the executive director has authorized an alternative disposition for a locomotive project, a hole—large enough to prevent repairs (usually at least 3 inches in diameter)—will need to be drilled through the engine block, and the frame rails will need to be cut so that repairs are not possible. The applicant must certify completion of the disposition of the old vehicle using forms supplied by the TCEQ. The TCEQ may require a certified or duplicate Texas Salvage Vehicle Title or Nonrepairable Vehicle Title as evidence that the vehicle has been scrapped. Grantees may be required to return grant funds if they fail to meet the disposition requirements.

If an alternative disposition plan is approved for a locomotive project, its details will be included in the grant contract and the grant recipient must commit to implementing the provisions as set forth in the contract. If the recipient fails to meet the provisions of the alternative disposition plan are not met, either the recipient must then destroy the old locomotive, as stated above, or the agency may require the grant recipient to return funds.

Monitoring and Reporting

The grant recipient must agree to monitor and track the use of grant-funded vehicles, equipment, infrastructure, and qualifying fuel for the activity life designated in the grant contract. The activity life is used to determine the total reductions in NO_X emissions and cost-effectiveness of the activities and the project.

Monitoring reports must be submitted to the TCEQ twice a year; they will document the usage over the required reporting period. The TCEQ may require applicants to use global positioning system units to monitor grant-funded equipment or allow voluntary use of a GPS unit in lieu of filing the required reports. All applicants monitoring via GPS will be required to use a vendor selected by the TCEQ.

If an alternative disposition plan is approved for a locomotive project, the grant recipient must agree to monitor and track the location of the old locomotive to ensure that it is not returned to Texas. The grant recipient must also agree to provide the TCEQ with the monitoring information, upon request. The grant recipient must notify the TCEQ immediately if the use of the locomotive, including where it is used, deviates from any approved alternative disposition plan.

Emissions Reduction Commitment

Over the activity life of each grant-funded activity, the grant recipient commits the generated emissions reductions to the State Implementation Plan. The recipient is responsible for performing the activities, as defined in the contract, necessary to achieve [achieving] the calculated NO_X emissions reductions within the eligible areas. Except in circumstances where the TCEQ determines that the intent of the program has been met, recipients [Recipients] will be required to return all or a pro rata share of the grant funds to the TCEQ if the emissions reductions over the activity life are not achieved.

In determining whether the intent of the program has been met, the TCEQ may consider the good-faith efforts of the grant recipient to meet the usage commitments originally projected. The TCEQ may consider circumstances that adversely impacted the ability of the recipient to use the grant-funded vehicle or equipment, such as major natural disasters and other factors not under the control of the grant recipient.

The TCEQ may include an annual NO_X emissions reduction commitment in the contract, where appropriate. At its discretion, the TCEQ may require the return of all or a pro rata share of grant funds if the annual emission reductions are not being achieved. The decision on whether to require return of all or a pro rata share of the grant funds may be based on, but is not limited to, an assessment of whether the annual performance is so low that it is unlikely that the grant recipient will be able to achieve the emissions reductions committed to over the activity life. The TCEQ may also use annual emissions reduction commitments to ensure that a grant recipient does not overachieve the emissions reductions during the first years of the activity life in order to underachieve the emissions reductions in later years.

The emissions reduction calculations are based on a usage amount (miles, hours, or fuel use) over the activity life. The TCEQ may require a usage commitment by the grant recipient or, alternatively, the TCEQ may establish default usage amounts either on a project category basis or for individual types of vehicles or equipment. Where a usage commitment is required, grant recipients must agree to operate the grant-funded vehicles or equipment in the eligible counties for the usage amounts committed to in the contract.

The TCEQ may work with the grantee to implement other options for ensuring that the emissions reduction commitments will be achieved before a return of grant funds is required. If the TCEQ requires the return of a pro rata share of the grant funds for underachievement of the annual emissions reduction commitment, the TCEQ may revise the commitment over the remaining activity life to a lower amount, based on a new projection of the emissions reductions.

Except where a percentage of use commitment is not required for that type of project, grant recipients must also agree to operate the grant-funded vehicle or equipment in the eligible counties for a minimum percentage of the annual

and/or total usage. Except in circumstances where the TCEQ determines that the intent of the program has been met, the recipient will be required to return all or a pro rata share of the grant funds to the TCEQ if the percentage of use commitment is not met. The TCEQ may work with the grantee to implement other options for ensuring that a percentage of use commitment will be met before a return of grant funds is required.

Chapter 6
Small-Business Grants Program

In accordance with Texas Health and Safety Code 386.116, the TCEQ is required to establish and administer a grant program targeted at small businesses and other entities that operate only a limited number of eligible vehicles and equipment.

Eligible Applicants

Applicants are potentially eligible for incentive funding if they operate or plan to operate on-road heavy-duty vehicles, non-road equipment, marine vessels, locomotives, or stationary engines primarily in one or more of the eligible counties, or if they otherwise contribute to NO_X emissions in the eligible counties.

For particular funding periods, the TCEQ may limit eligibility to certain types of applicants. The TCEQ may also allow a person other than the owner or operator of the vehicle or equipment to apply for and receive a grant, as long as the grant-funded project supports activities that meet these guidelines and will help to achieve the goals of the TERP.

Under this program, a "small business" is defined as a "person" (that is, an individual or organization; see Glossary [Chapter 2] for a more specific definition) that has owned (for more than one year) and operates not more than two vehicles or pieces of equipment, one of which is an on-road diesel heavy-duty vehicle with an engine from a model year before 1994 or a non-road diesel-powered piece of equipment with an engine with uncontrolled emissions.

Eligible Activities

Activities eligible for small-business grants are intended to reduce NO_X emissions in the designated eligible counties from on-road heavy-duty vehicles, non-road equipment, marine vessels, locomotives, or stationary engines.

Most of the engines eligible under this program will be powered by diesel-fueled compression-ignition engines. However, engines powered by other fuels may also be eligible, subject to decisions by the TCEQ for particular funding periods and geographic areas.

All project categories listed under the Emissions Reduction Incentive Grants program described in Chapter 4 of these guidelines may be eligible for funding in the small-business grants program. At a minimum, the grants will be available for the replacement or repower of an on-road heavy-duty vehicle with an engine from a model year before 1994, and for the replacement or repowering of non-road equipment with an engine with uncontrolled emissions.

Grant Program Procedures

This section contains the general procedures that will be used for the application, awarding, and administration of grants under this program. The TCEQ may adjust these procedures and develop more detailed procedures, as needed, to ensure the effectiveness of the program.

Project Solicitation

The TCEQ will make information available on times when applications may be filed for small-business grants, based on the expected availability of funding for the program. To the extent possible, the TCEQ will keep dealers and installers informed of the availability of funds for the program. The TCEQ may also limit the grants to certain geographic areas, based on the needs of the program. Small-business grants may be funded through another grant program, such as the Rebate Grants program. Information and funds available for small-business grants will be posted in the Requests for Applications (RFAs) or Notice of Rebate Grants (NRGs).

The TCEQ may establish a cost-effectiveness threshold for particular funding periods and geographic areas.

Application Review and Selection

Grant applications will be reviewed and evaluated according to criteria established in these guidelines and the NRGs. In general, the selection priorities may include allocation of the funding among a subset of the eligible counties, as well as allocation among the various types of project categories.

Grant applications will be reviewed and evaluated according to criteria established in these guidelines and the NRGs. In general, the selection priorities may include allocation of the funding among a subset of the eligible counties, as well as allocation among the various types of project categories.

Vehicle, Equipment, and Engine Disposition Verification

The applicant must agree to destroy the old vehicle or equipment (including the engine) within 90 days of receiving reimbursement by the TCEQ, provided, however, that for a locomotive project the executive director may allow permanent removal from the Texas in specific grants where the applicant has furnished adequate assurances that the old locomotive will not be returned to Texas.

Except where the executive director has authorized an alternative disposition plan for a locomotive project, a hole—large enough to prevent repairs (usually at least 3 inches in diameter)—will need to be drilled through the engine block, and the frame rails will need to be cut so that repairs are not possible. The applicant must certify completion of the disposition of the old vehicle using forms supplied by the TCEQ. The TCEQ may require a certified or duplicate Texas Salvage Vehicle Title or Nonrepairable Vehicle Title as evidence that the vehicle has been scrapped. Grantees may be required to return grant funds if they fail to meet the disposition requirements.

If an alternative disposition plan is approved for a locomotive project, its details will be included in the grant contract and the grant recipient must commit to implementing the provisions as set forth in the contract. If the recipient fails to meet the provisions of the alternative disposition plan are not met, the recipient must then either destroy the old locomotive, as stated above, or the agency may require the grant recipient to return funds.

Monitoring and Reporting

The grant recipient must agree to monitor and track the use of grant-funded vehicles and equipment for the activity life designated in the grant contract. The activity life is used to determine the total reductions in NO_X emissions and cost-effectiveness of the activities and the project.

Monitoring reports must be submitted to the TCEQ twice a year; they will document the usage over the required reporting period. The TCEQ may require applicants to use global positioning system units to monitor grant-funded equipment or allow voluntary use of a GPS unit in lieu of filing the required reports. All applicants monitoring via GPS will be required to use a vendor selected by the TCEQ.

If an alternative disposition plan is approved for a locomotive project, the grant recipient must agree to monitor and track the location of the old locomotive to ensure that it is not returned to Texas. The grant recipient must also agree to provide the TCEQ with the monitoring information, upon request. The grant recipient must notify the TCEQ immediately if the use of the

locomotive, including where it is used, deviates from any approved alternative disposition plan.

Emissions Reduction Commitment

Over the activity life of each grant-funded activity, the grant recipient commits the generated emissions reductions to the State Implementation Plan. The recipient is responsible for performing the activities, as defined in the contract, necessary to achieve [achieving] the calculated NO_X emissions reductions within the eligible areas. Except in circumstances where the TCEQ determines that the intent of the program has been met, recipients [Recipients] will be required to return all or a pro rata share of the grant funds to the TCEQ if the emissions reductions are not achieved.

A small-business grant may be awarded under the criteria for either the Emissions Reduction Incentive Grants Program or the Rebate Grants Program. The emissions reduction and usage requirements for the applicable program will apply.

Chapter 7
Third-Party Grants Program

Texas Health and Safety Code 385.103(a) authorizes the TCEQ to allow a person other than the owner to apply for and receive a grant in order to improve the ability of the program to achieve its goals.

Eligible Applicants

Public agencies, such as those able to coordinate local and regional projects, are eligible to apply for third-party grants. Third-party applicants will need to be able to pass through money to eligible applicants. The TCEQ may limit eligible applicants, areas, and projects. Applicants will be considered case by case.

Eligible Activities

Activities eligible for third-party grants are intended to reduce NO_x emissions in the designated eligible counties from on-road heavy-duty vehicles, non-road equipment, marine vessels, locomotives, or stationary engines.

Most of the engines eligible under this program will be powered by diesel-fueled compression-ignition engines. However, engines powered by other fuels may also be eligible, subject to decisions by the TCEQ for particular funding periods and geographic areas.

All project categories listed under the Emissions Reduction Incentive Grants program in Chapter 4 of these guidelines may be eligible for funding under the Third-Party Grants program, subject to a determination by the TCEQ for each third-party grant. In some cases, the TCEQ may require that a third party has already identified the projects to be funded prior to submitting an application.

Grant Program Procedures

This section contains the general procedures that will be used for the application, awarding, and administration of grants under this program. The TCEQ may adjust these procedures and develop more detailed procedures, as needed, to ensure the effectiveness of the program.

Project Solicitation

The TCEQ will make information available on times when applications may be filed for third-party grants, based on the expected availability of funding for the program.

The TCEQ may establish a cost-effectiveness threshold for particular funding periods and geographic areas.

Application Review and Selection

The agency will evaluate grant applications according to the project's ability to meet and support the goals of the TERP. In general, the selection priorities may include allocation of the funding among a subset of the eligible counties, as well as allocation among the various emissions-reduction categories.

Potential applicants will work with the TCEQ to determine the goals and priorities of the third-party grants.

Awarding of Grants and Contracting

Projects selected for funding will be awarded a grant through the development and execution of a contract that is signed by the third-party grant recipient and by an official of the TCEQ. Grant contracts may contain additional and more specific requirements than those contained in these guidelines. Grant recipients should review the contract's language carefully before accepting and signing it.

Because the funding for this program comes from revenue that is received throughout the year, all grant awards and contracts will be contingent upon the receipt of sufficient revenue to cover the grant.

Grant contracts will include the minimum requirements for use of the funds, including the pass-through of funding by the recipient. Administrative costs of the third-party grant recipient will not be eligible for funding under this program.

To the extent needed to ensure compliance with the program requirements, the TCEQ may require pre-approval authority over the funding decisions of the grant recipient and over the contracts and agreement used by the recipient as part of a pass-through program.

Any pass-through agreements and other contracts used by the grant recipient must ensure compliance with these guidelines and other requirements imposed by the TCEQ.

Reimbursement

The TCEQ will establish the payment and reporting processes case by case. Payments may be reimbursements, meaning that payment will be made after expenses are incurred by the grant recipient. In some cases, the TCEQ may also authorize advance payments, based on the expected or final selection of pass-through projects or other projects.

The grant contract and the payment forms will include requirements for documentation of expenses. The TCEQ may also require approval authority over the payment processes used by the grant recipient to fund a pass-through project or other project.

Monitoring and Reporting

The grant recipient will be required to establish a mechanism to monitor and track the use of grant-funded on-road heavy-duty vehicles, non-road equipment, marine vessels, locomotives, or stationary engines.

The recipient must also submit reports on project status for the period designated by the TCEQ in the grant contract and upon final completion of all grant-funded activities.

Emissions-Reduction Commitment

Over the activity life of each grant-funded activity, the third-party grant recipient commits the generated emissions reductions to the State Implementation Plan. The recipient is responsible for enforcing the emissions reduction commitments by sub-grant recipients. The TCEQ may require return of all or a pro rata share of the grant funds for failure to enforce the emissions reduction requirements.

Sub-Grant Program Procedures

This section contains the general procedures that will be used for the application, awarding, and administration of pass-through grants. The TCEQ may adjust these procedures and develop more detailed ones, as needed, to ensure the effectiveness of the program.

Project Solicitation

The third-party grant recipient will announce solicitations for projects in accordance with the third-party grant contract between the TCEQ and the recipient.

The third-party grant recipient will make information available on times when applications may be filed for grants, based on the expected availability of funding for the program. To the extent possible, the third-party grant recipient will keep dealers and installers informed of the availability of funds for the program.

Application Review and Selection

The third-party grant recipient will evaluate grant applications according to criteria established in these guidelines and the Requests for Applications (RFAs). Project selections will be made using ranking and scoring procedures that will be explained in the RFAs or in the order received. The RFA will explain the procedure for application review and selection.

The TCEQ will establish cost-effectiveness thresholds that may not be exceeded by the third-party grant recipients in awarding pass-through grants. However, the third-party grant recipient may establish a lower threshold than the limit set by the TCEQ for particular funding periods and geographic areas.

Application Verification Visits

Upon receipt of a grant application, the third-party grant recipient may check the vehicle and equipment for condition, engine identification, and vehicle identification.

Awarding of Grants and Contracting

Projects selected for funding will be awarded a grant through the development and execution of a grant contract that is signed by the sub-grant recipient and by the third-party grantee. Grant contracts may contain additional and more specific requirements than those contained in these guidelines. Grant recipients should review the contract language carefully before accepting and signing the contract.

Because the funding for this program comes from revenue that is received throughout the year, all grant awards and contracts will be contingent upon the receipt of sufficient revenue to cover the grant.

Reimbursement

Grant payments will be reimbursements, meaning that payment will be made after the eligible expense has been incurred by the grant recipient. The third-party grant recipient may, but is not required to, give the sub-grant recipients the option to assign their grant payments directly to a dealer or service provider. The third-party grantee will supply reimbursement request and reporting forms for use by the grant recipient.

In some cases, particularly for large and lengthy projects, the TCEQ may also authorize advance payments, based on a percentage of the expected final costs. The grant contract and the reimbursement forms will include requirements for documentation of expenses.

Upon completion of all grant-funded purchases, the grant recipient will need to submit a final request for reimbursement of all remaining unreimbursed expenses. The final reimbursement request must include a completed and signed release of claims.

The grant recipient must also agree to place a label or sticker on grant-funded vehicles and equipment, as may be supplied by the TCEQ.

Vehicle, Equipment, and Engine Disposition Verification

The applicant must agree to destroy the old vehicle and equipment (including the engine) within 90 days of receiving reimbursement from the third-party grant recipient, provided, however, that for a locomotive project, the executive director may allow permanent removal from Texas in specific grants where the applicant has provided sufficient assurances that the old locomotive will not be returned to Texas. The TCEQ may require the third-party grantee to request approval from the executive director for acceptance of an alternative disposition plan for a locomotive project.

Except where an alternative disposition plan is authorized for a locomotive replacement project, a hole, large enough to prevent repairs (usually at least 3 inches in diameter), will need to be drilled through the engine block, and the frame rails will need to be cut so that repairs are not possible. A certification of the disposition of the old vehicle must be provided, using forms supplied by the third-party grantee. The third-party grantee may require a certified or duplicate Texas Salvage Vehicle Title or Nonrepairable Vehicle Title as evidence that the vehicle has been scrapped. Grantees may be required to return grant funds if they fail to meet disposition requirements.

If an alternative disposition plan is approved for a locomotive project, its details will be included in the grant contract and the grant recipient must commit to implementing the provisions as set forth in the contract. If the recipient fails to meet the provisions of the alternative disposition plan are not met, the recipient

must then either destroy the old locomotive, as stated above, or the agency may require the recipient to return funds.

Monitoring and Reporting

The grant recipient must agree to monitor and track the use of grant-funded vehicles, equipment, infrastructure, and qualifying fuel for the activity life designated in the grant contract. The activity life is used to determine the total reductions in emissions of NO_X and the cost-effectiveness of the activities and the project.

The recipient must submit monitoring reports to the third-party grantee twice a year. These reports will include information on usage over the required reporting period. The third-party grantee may require applicants to use global positioning system units to monitor grant funded equipment, or allow voluntary use of a GPS unit in lieu of filing the required reports. All applicants monitoring via GPS will be required to use a vendor selected by the TCEQ.

If an alternative disposition plan is approved for a locomotive replacement project, the grant recipient must agree to monitor and track the location of the old locomotive to ensure that it is not returned to Texas. The grant recipient must also agree to supply all monitoring information to the third-party grantee upon request. The grant recipient must notify the third-party grantee immediately if the use of the locomotive, including where it is used, deviates from the approved alternative disposition plan.

Emissions Reduction Commitment

Over the activity life of each grant-funded activity, the sub-grant recipient commits the generated emissions reductions to the State Implementation Plan. The sub-grant recipient is responsible for performing the activities, as defined in the contract, necessary to achieve [achieving] the calculated NO_X emissions reductions within the eligible areas.

The third-party grant recipient will implement and enforce emissions reduction commitments by the sub-grant recipients according to the criteria established for the Emissions Reduction Incentive Grants Program or the Rebate Grants Program, as applicable to the approach used to award and administer the sub-grants. The TCEQ may include more specific enforcement requirements in the third-party grant contracts.

Appendix 1
On-Road Heavy-Duty Vehicles

This section gives the methods for calculating the NO_X emissions reductions for an on-road vehicle project. Most of the calculations will require input of a NO_X emissions factor applicable to the engine, the vehicle, or both. The emissions standards and emissions factors applicable to this program are included in a technical supplement, which will be made available in conjunction with these guidelines at the TERP Web site, <www.terpgrants.org>. Examples of the calculations will also be available in the supplement, along with other materials prepared by the TCEQ. Potential grant applicants may also contact the TCEQ for hard copies of the supplement and for answers to questions about the applicable emissions standards and factors.

Eligible Activities and Costs

Eligible activities and costs under each project category are explained in this section. The TCEQ may further limit the types of eligible activities and may more narrowly define eligibility requirements during a particular funding period, as needed to best achieve the goals of the TERP.

Purchase or Lease of On-Road Heavy-Duty Vehicles

This category is for the purchase or lease of **new** on-road heavy-duty vehicles. The cost may also include the purchase and installation of a global positioning system, subject to approval by the TCEQ. For this category, the TCEQ does not consider whether the applicant is replacing an existing vehicle; the baseline for comparison of emissions is the current federal NO_x emissions standard for that vehicle. The baseline vehicles used for determining the difference in cost must be new vehicles.

To be eligible for funding, the new vehicle must be certified as emitting at least 25 percent less NO_X than required (in other words, no more than 75 percent of the NO_X allowable) under the current federal standard for that vehicle. "Certification" means approval by the U.S. EPA or the California Air Resources Board (CARB), or acceptance on other grounds by the TCEQ.

A *lease* is defined as the use and control of a new on-road heavy-duty vehicle, in accordance with a lease contract for a period of five or more years. The TCEQ

will reimburse the incremental costs of the lease—costs above those that would otherwise have been incurred for the lease of a baseline vehicle.

The TCEQ will reimburse the incremental cost of the *purchase* of a new on-road heavy-duty vehicle. The incremental cost is the difference between the manufacturer's suggested retail price, the documented dealer price of a baseline vehicle, or other appropriate baseline cost established by the TCEQ, and the actual cost of the cleaner vehicle.

Replacement of On-Road Heavy-Duty Vehicles

This category is for the replacement of an on-road heavy-duty vehicle with a new or newer on-road heavy-duty vehicle. For a replacement project, the TCEQ will evaluate whether the vehicle being replaced would have otherwise been used in the eligible counties for the period within which the emissions reductions will be claimed. Standards that apply include **all** of the following:

- The applicant's name must be listed as the owner on the front of the vehicle title.
- The applicant must have continuously owned the vehicle and have been listed as the owner on the title for a minimum of two years immediately preceding the grant application.
- The vehicle must currently be registered for operation in Texas in the applicant's name.
- Unless otherwise approved by the TCEQ, the vehicle must have been continuously registered and used in Texas for the two years preceding [two years] the application date.
- The vehicle must be in good operational condition and capable of performing its primary function.
- The vehicle must have a current safety inspection (if a safety inspection is required for that vehicle and use) and must have continuously had an up-to-date safety inspection over the preceding two years.

The TCEQ may waive the two-year ownership requirement, case by case, where the ownership of the company has changed, the assets of the company have been purchased by another company, or the company has changed names or incorporation status. The use or vocation (for example, regional delivery) of the vehicles being replaced must not have changed.

The TCEQ may waive the two-year registration requirement for seasonal agricultural activities and other applications where seasonal use is a standard practice of the industry. The historical usage provided by the applicant on the grant application forms must reflect the limited and intermittent use of the vehicle in those activities.

For on-road vehicles used exclusively for off-road purposes the TCEQ may, on a case by case basis, waive the requirement that a vehicle have a current registration and safety inspection and that the vehicle had a continuous registration and safety inspection for the two years preceding the submission date of the application. The vehicle must not be subject to state vehicle registration and inspection requirements.

The TCEQ may require additional documentation to verify that the vehicle being replaced would have been used within the eligible counties.

The replacement vehicle must be certified to emit at least 25 percent less NO_X than the vehicle being replaced. The baseline for comparison of emissions is the difference between the emissions of the vehicle being replaced and the emissions of the vehicle being purchased. "Certification" means approval by the U.S. EPA, the CARB, or acceptance on other grounds by the TCEQ.

The replacement vehicle must be of the same type, weight category, and body and axle configuration as the vehicle being replaced. The replacement vehicle must be configured and intended for use in the same application or vocation (for example, regional delivery), as the vehicle being replaced. The TCEQ may accept, on a case-by-case basis, vehicles of a different type, weight category, and/or body and axle configuration to account for the latest technology used for a specific vocation.

The grant recipient may be eligible for reimbursement of up to 80 percent of the eligible costs for the purchase or lease of the replacement vehicle, not to exceed an incentive amount that results in a cost-effectiveness of $15,000 per ton of NO_X reduced. The TCEQ may further limit the incentive amount to a cost-effectiveness lower than $15,000 per ton for particular funding periods, as needed to best achieve the goals of the TERP.

Costs may include the invoice price, with taxes and delivery charges included in the price of the replacement vehicle, or the cash basis for the lease charges. The cost may also include the purchase and installation of a global positioning system, subject to approval by the TCEQ. Delivery charges from a third party not included in the invoice price from the vehicle or equipment vendor may be included also, subject to approval by the TCEQ.

The total incentive amount must not exceed 80 percent of the cost of the replacement vehicle minus the scrappage value received for the old vehicle. The TCEQ may establish a default scrappage value.

Repower of On-Road Heavy-Duty Vehicles

This category is for the replacement of an existing engine on an on-road heavy-duty vehicle with a new, rebuilt, or remanufactured engine. The engine must be certified to emit 25 percent less NO_X than the engine being replaced, based on

the federal standard for that engine. "Certification" means approval by the U.S. EPA or the CARB, or acceptance on other grounds by the TCEQ.

Repowers resulting in any alteration from an original configuration of a vehicle or engine must comply with the provisions of EPA Memorandum 1A related to ensuring that altered vehicles and engines continue to meet required emissions standards. Copies of Memo 1A are available from the EPA and the TCEQ, and will be made available on the TERP Web site at <www.terpgrants.org>.

Eligible rebuilt or remanufactured engines must use original-engine-manufacturer components only and be purchased from the OEM or its authorized dealers and distributors. However, the TCEQ may accept engines from suppliers not connected with the OEM, subject to a case-by-case determination.

The TCEQ will reimburse the incremental cost of the replacement engine. The incremental cost is the cost to purchase and install the replacement engine and associated equipment minus the scrappage value received for the old vehicle. The TCEQ may establish a default scrappage value. The total incentive amount also must not exceed the cost of the replacement engine.

Costs that may be reimbursed, subject to approval by the TCEQ, include:

- the invoice cost of the new engine, including sales tax and delivery charges,
- the invoice cost of additional equipment that must be installed with the new engine,
- associated supplies directly related to the installation of the engine,
- the costs to remove and dispose of the old engine,
- installation costs,
- reengineering costs, if the vehicle or equipment must be modified for the new engine to fit, and
- other costs directly related to the project, including the purchase and installation of a global positioning system.

Retrofit or Add-On of Emissions-Reduction Technology

This category is for the retrofit of an existing engine on an on-road heavy-duty vehicle, or adding on devices to the vehicle. To be eligible for funding, the retrofit or add-on systems must be verified to emit at least 25 percent less NO_x than the engine prior to the retrofit or add-on. "Verification" means approval by the EPA or the CARB, or acceptance on other grounds by the TCEQ.

Retrofits and add-on activities resulting in any alteration from an original configuration of a vehicle or engine must comply with the provisions of EPA Memorandum 1A, related to ensuring that altered vehicles and engines continue to meet required emissions standards. Importantly, aftermarket systems for

converting a vehicle and engines to alternative fuel operation must comply with EPA certification requirements under Memo 1A. Copies of Memo 1A are available from the EPA and the TCEQ, and will be made available on the TERP web site at <www.terpgrants.org>.

The TCEQ will reimburse the incremental cost of the purchase and installation of the retrofit or add-on technology. If the engine is to be rebuilt to install the emissions-reduction devices, the incremental cost is the difference between the cost of rebuilding the existing engine and the cost of rebuilding the engine to include the retrofit or add-on technology. If the engine does not need to be rebuilt in conjunction with installing the new technology, then the incremental cost will be the full cost of purchasing and installing the technology.

Costs that may be reimbursed, subject to approval by the TCEQ, include:

- the invoice cost of the retrofit kit or add-on devices, including sales tax and delivery charges,
- associated supplies directly related to the installation of the devices,
- installation costs,
- reengineering costs, if the vehicle or equipment must be modified for the retrofit or add-on devices to be installed and used, and
- other costs directly related to the project, including the purchase and installation of a global positioning system.

Project Criteria

In addition to the eligibility criteria previously presented, the following list of criteria applies to projects involving on-road heavy-duty vehicle activities. The TCEQ may impose additional criteria, and may more narrowly define the criteria established in this guide, under a particular funding period, as needed to best achieve the goals of the TERP.

- One or more eligible **activities** of the same project type (i.e., on-road, non-road, locomotive, etc.) that will occur in the same primary area may be included under one project application.
- The applicant must own the vehicle being replaced, repowered, or retrofitted and the applicant's name must be on the front of the vehicle title.
- Vehicles and equipment used primarily for competition or recreation are not eligible for funding under any of the project categories.
- On-road heavy-duty vehicle activities must provide a NO_X emissions reduction compared to baseline NO_X emissions. The NO_X emissions of vehicles, engines, and retrofit/add-on devices used to achieve the emissions reductions must be certified or verified by the EPA or the CARB, or otherwise accepted by the TCEQ. In situations where the model year of the vehicle and

the model year of the existing engine are different, such as in a vehicle that has already had its engine replaced with a newer engine, the model year of the engine must be used to determine the baseline emissions standard for emissions-reduction calculations. How the 25 percent reduction criterion applies to each type of activity is explained below.

Purchases and leases are allowed based on what year the purchase or lease is completed. At a minimum, the vehicle and engine being purchased or leased must be certified to emit at least 25 percent less NO_X than the current federal NO_X emissions standard for that vehicle.

Replacements. The replacement vehicle and engine must have been certified to emit at least 25 percent less NO_X than the vehicle being replaced. For example, if an applicant wants to replace a 1989 bus with a 1999 bus, the replacement bus and engine must have been certified to emit 25 percent less NO_X than the 1989 emissions standard.

Repowers. The replacement engine must be certified to emit at least 25 percent less NO_X than the engine being replaced.

Retrofits and add-ons. Emissions standards for retrofit and add-on activities are based on the model year of the engine being retrofitted. The retrofit or add-on technology must be verified to emit at least 25 percent less NO_X than the standard for the vehicle and engine being retrofitted. For example, if an applicant wants to retrofit the engine on a bus in 2002, and the bus engine was originally manufactured in 1996, then the retrofit kit must have been verified to result in NO_X emissions that are 25 percent less than the original (1996) certified emissions level of the vehicle and engine.

Combined technologies. Where two technologies (for example, repower plus retrofit) are combined on the same vehicle or engine, the TCEQ may consider the combined reductions from the two technologies in meeting the 25 percent requirement. This decision will be solely at the discretion of the TCEQ, and will be based on its determination that the combination of the two technologies will permanently reduce emissions by at least 25 percent.

- The cost-effectiveness of a project, other than a demonstration project, must not exceed $15,000 per ton of NO_X emissions reduced in the eligible counties for which the project is proposed. Individual activities included under a single project application may exceed this amount, but the combined project must meet the cost-effectiveness standard.
- Infrastructure activities—including infrastructure costs that are part of a broader repower, retrofit, replacement or add-on project—are excluded from the cost-effectiveness limit of $15,000 per ton.
- An activity is not eligible if it is required by any state or federal law, rule, regulation, memorandum of agreement, or other legally binding document. However, this restriction does not apply to an otherwise qualified activity—regardless of the State Implementation Plan's assumption that the

- The incremental cost of the proposed activity must be reduced by the value of any existing financial incentive that directly reduces the cost of the proposed activity, including tax credits or deductions, other grants, or any other public financial assistance.
- In the areas of the state where Texas Low Emission Diesel (TxLED) is required the baseline and reduced emissions-rate calculations for diesel-engine usage after September 2005 must be adjusted using a correction factor, in addition to any other calculation adjustments.

Figure A1.1
Correction Factor for TxLED

The TCEQ adopted rules (30 TAC 114.312–319) requiring that diesel fuel sold or supplied for use in compression-ignition engines in certain counties in Texas must meet low-emission-diesel standards.

The counties affected by the TxLED requirements currently include all of the counties eligible for TERP incentive funding, as listed in Table 3.1, except for El Paso County.

The requirements set a maximum for content of aromatic hydrocarbons of 10 percent by volume. The requirements also set a minimum cetane number for TxLED of 48.

The TxLED requirements are intended to result in reductions in NO_X emissions from diesel engines. Currently, reduction factors of **5.7 percent** (0.057) for on-road use and **7.0 percent** (0.07) for non-road use have been accepted as estimates for use of TxLED. However, this reduction estimate is subject to change, based on the standards accepted by the EPA for use in the Texas State Implementation Plan. The TCEQ will identify the appropriate reduction factor to use in the technical supplement prepared to support these guidelines.

For activities in the applicable counties, a correction factor will need to be applied when calculating the baseline or reduced emissions for diesel engines.

On-road:
TxLED correction factor = 1 – 0.057 = ***0.943***

Non-road:
TxLED correction factor = 1 – 0.070 = ***0.93***

- An activity involving a new emissions-reduction measure that would otherwise generate marketable credits under state or federal emissions

reduction credit averaging, banking, or trading programs is not eligible for funding under this program unless:

  - the activity includes the transfer of the reductions that would otherwise be marketable credits to the state implementation plan or the owner or operator as provided under Texas Health and Safety Code 386.056, and
  - the reductions are permanently retired.

- For repower activities, eligible rebuilt or remanufactured engines must use original-engine-manufacturer components only and be purchased from the OEM or its authorized dealers and distributors. However, the TCEQ may accept engines from suppliers not connected with the OEM, subject to a case-by-case determination.
- For all activities, the activity life must be a minimum of five years. The TCEQ may establish longer activity life requirements for each grant period. Not less than 75 percent of the annual usage of the vehicle must take place in one or more of the eligible counties and designated highways throughout the life of the project. Leases must be for the length of the activity life, and 75 percent of the annual usage over the lease period must take place in one or more of the eligible counties and designated highways or roadways. At the Executive Director's discretion the TCEQ may establish a minimum percentage requirement for use of the vehicle in the eligible counties with each grant application period.
- For most on-road vehicles, annual usage is to be measured using miles of operation. For refuse vehicles, street sweepers, and other vehicles with substantial power-take-off operations, fuel consumption normally should be used as the usage factor. The TCEQ may consider using either miles of operation or fuel consumption for particular applications on a case-by-case basis.
- Applicants should refer to the technical supplements to these guidelines available at the TERP Web site for the maximum acceptable activity life established by the TCEQ for each type of activity.
- Applicants must agree to monitor the use of grant-funded vehicles, equipment, infrastructure, and fuel, and to report to the TCEQ for the life of each grant-funded activity.
- Applicants must also agree to notify the TCEQ of any changes during the life of the following activities: termination of use; change in use, sale, transfer, or accidental or intentional destruction of grant-funded vehicles or equipment; or change in use of the qualifying fuel.
- Administrative costs and other internal costs of the grant recipient, including but not limited to personnel expenses, internal salaries, indirect costs, and travel are not eligible. This restriction also applies to situations where the grant recipient acts as a transportation provider for delivery of the grant-funded vehicle or equipment before or after accepting it.

- Consultant fees for the preparation of a grant application, either directly or as an addition of the cost basis of the grant-funded vehicle, equipment, or engine, are not eligible for reimbursement by the TCEQ.
- Fees for a third-party consultant hired by the grant recipient to manage and administer the grant-funded activities, including coordination of the work and submission of reports and paperwork to the TCEQ for the grant recipient, are not eligible. This restriction is not intended to limit the ability of the vehicle or equipment supplier or installer to include reasonable and necessary costs for managing the work to be performed in the price of the vehicle, equipment, or installation services. The costs for professional services, including engineering and technical work, required for completion of the activity may be included, subject to the restrictions pertaining to that type of project. Per the Uniform Grant Management Standards, the cost plus a percentage of cost methods of contracting for professional services shall not be used.
- Vehicles used at port facilities and other inter-modal delivery and transportation facilities and commonly referred to as *terminal tractors* or *yard trucks* may have engines certified to either the federal on-road or non-road emission standards. Both the on-road and non-road versions of these vehicles perform the same primary functions and the on-road versions are usually limited in the distance traveled on roads and highways. To account for these similarities in use, the TCEQ may allow, at its discretion, an applicant to apply for a project involving a terminal tractor with an on-road engine under the non-road forms and criteria. This provision does not include on-road vehicles that are not designed and manufactured as a terminal tractor, even if the vehicle is being used in that role.
- The TCEQ may impose additional criteria for certain projects and funding periods, consistent with these guidelines.

NO_x Emissions Standards

The baseline NO_X emissions standards for this program will be the federal standard for NO_X emissions applicable to the type of engine and model year of vehicle. The federal NO_X emissions standards for on-road (highway) heavy-duty engines are listed in the technical supplement available from the TERP program. Potential grant applicants should consult with the TCEQ to ensure they use the appropriate baseline standards.

Calculating NO_X Emissions Reductions

In general, the emissions-reduction benefit represents the difference in the emissions level of a baseline vehicle or engine and a reduced-emissions vehicle

or engine. In situations where the model year of the vehicle chassis and the model year of the existing engine are different, the model year of the engine must be used to determine the baseline emissions for benefit calculations.

The emissions level is calculated by multiplying an emissions factor, an activity level, and a conversion factor, if necessary. Because conversion factors and the activity levels may be expressed in different units for the existing and replacement engines, the emissions levels for the baseline and reduced-emissions vehicles or engines should be calculated separately and then differences taken to determine emissions reductions.

Different types of on-road vehicles operate very differently. For most on-road applications, the activity level should be established by the annual mileage. Refuse haulers, street sweepers, and other on-road vehicles with significant power take-off operations are an exception, and the activity level may be determined based on annual fuel consumption. Emissions-reduction calculations should be consistent with the type of records maintained over the life of each activity.

Calculation of NO_X Emissions Reductions Based on Annual Mileage

The calculation of emissions and emissions reductions using annual mileage as the usage factor is determined by the steps in Table A1.1.

Table A1.1
Calculating NO_x Emissions Reductions Based on Annual Mileage

Applying the TxLED Correction Factor

The counties affected by the TxLED requirements currently include all of the counties eligible for TERP incentive funding, as listed in Table 3.1, except for El Paso County.	
TxLED correction factor for on-road: *1 – 0.057*	0.943

Step 1. Determine the NO_x Emissions Factor

Determine baseline NO_x emissions factor (g/mi)	
Baseline NO_X emissions standard (g/bhp-hr)	
× TxLED correction factor (*diesel engines only*)	
= correction g/bhp-hr	
× conversion factor (bhp-hr/mi)	
= baseline NO_X emissions factor (g/mi)	
Determine reduced NO_X emissions factor (g/mi)	
Option A. Reduced-emissions technology verified to achieve a percentage reduction from the baseline	
Baseline NO_X emissions factor (g/mi)	
× verified percentage reduction from baseline	
= reduced NO_X emissions factor (g/mi)	
Option B. Reduced-emissions engine certified to a specific emissions standard (g/bhp-hr)	
Certified NO_X emissions (g/bhp-hr)	
× TxLED correction factor (*diesel engines only*)	
= corrected g/bhp-hr	
× conversion factor (bhp-hr/mi)	
= reduced NO_X emissions factor (g/mi)	

Step 2: Calculate the NO_x Emissions Reduction

Baseline g/mi – reduced emissions g/mi	
× annual miles of operation	
× percent within eligible counties (%)	
= grams per year reduced (g/yr)	
	÷ 907,200 grams per ton
= estimated annual NO_X emissions reduction (tons/yr)	
× activity life (years)	
= estimated activity-life NO_X emissions reduction (tons)	

The applicable NO_X emissions standards are included in the technical supplement available from the TERP Program.

For retrofit and add-on activities, as well as other activities, where the emissions reductions are based on a percentage reduction from the baseline, the verified percentage reduction factor can be applied to the applicable emissions factor to determine the reduced NO_X emissions factor.

Alternatively, for activities where the emissions of the new or replacement engine are certified at a specific emissions level (g/bhp-hr), such as purchases or repowers, a conversion factor is needed to determine an appropriate emissions factor in grams per mile. Appropriate conversion factors, to convert g/bhp-hr to g/mi, are included in the technical supplement available from the TERP Program.

Calculation of NO_X Emissions Reductions Based on Annual Fuel Use

Refuse vehicles, street sweepers, and other on-road vehicles with significant power take-off operations accrue low mileage, yet intermittently operate at high load during compaction or sweeping mode. Therefore, annual fuel use is a more appropriate emissions factor to use for these vehicles. Alternatively, an applicant may base the emissions reductions on annual mileage for these types of vehicle uses, provided sufficient supporting documentation is submitted as determined by the TCEQ.

If annual fuel consumption is the basis for the emissions reductions, an energy consumption factor is used to convert g/bhp-hr to g/gal of fuel used. There are two ways of calculating an engine-specific energy consumption factor:

1. divide the hp of the engine by the fuel economy in gal/hr; or

2. divide the density of the fuel by the brake-specific fuel consumption of the engine.

While actual fuel receipts or other documentation may support the annual fuel consumption for a baseline engine, the annual fuel consumption of the new vehicle or engine is an estimated proportion to the change in the energy consumption factor.

Heavy-duty diesel engines typically have a brake-specific energy consumption of 6,500 to 7,000 British thermal units (Btu) per hp-hour on the certification cycle. Diesel fuel has an energy density of about 18,000 Btu/lb and a mass density of 7.0 lb/gal. This results in an energy consumption factor of about 18.5 hp-hour/gal of fuel consumed, which should be used as the default for vehicles.

Default fuel consumption rate factors may be included in the technical supplement to these guidelines.

In general, the calculation of emissions reductions should be based on the same fuel use amount for the baseline and the reduced-emission vehicle/engine. However, the TCEQ may accept, at its discretion, fuel economy benefits of the new or repowered vehicle over the baseline unit when calculating emissions reductions.

For example, a new hybrid-electric utility truck may offer fuel use savings by powering the non-propulsion systems using a battery. The emissions reductions from this fuel savings may be considered by the TCEQ on a case-by-case basis.

To use this approach, the application must list the percentage reduction in fuel use expected through use of the reduced-emission vehicle when compared to the baseline. For Replacement Activities, the application should also list the historical average annual fuel use of the old vehicle (baseline) and an annual fuel use commitment for use of the new or repowered vehicle.

Documentation must be submitted with the application to justify the reduced fuel use amount. The TCEQ will evaluate the documentation to determine the level of fuel savings that may be accepted.

Regardless of the baseline fuel use amount listed in the application, the TCEQ will apply a fuel economy factor to the fuel use commitment listed for the reduced-emission vehicle and engine. For instance, if the TCEQ agrees that the reduced-emission vehicle fuel use will be 30 percent less than the baseline vehicle fuel use for the same amount of work, then the baseline fuel use for the calculation will be determined by multiplying the fuel use commitment by a factor of 1.43 (1/0.70 = 1.43). If the historical annual fuel use listed in the application is less than the number derived by applying the fuel economy factor, then that lower baseline number will be used.

The applicant must enter a realistic fuel use commitment for the expected work to be performed by the reduced-emission vehicle. If a grant is awarded, the grant

recipient is obligated to use at least that amount of fuel annually in order to meet the grant usage requirements over the activity life.

Table A1.2
Calculating NO_X Emissions Reductions Based on Annual Fuel Use

Applying the TxLED Correction Factor

The counties affected by the TxLED requirements currently include all of the counties eligible for TERP incentive funding, as listed in Table 3.1, except for El Paso County.	
TxLED correction factor for on-road: *1 – 0.057*	0.943

Step 1. Determine the Reduced NO_X Emissions Factor

Option A. Reduced-emissions technology verified to achieve a percentage reduction from the baseline	
Baseline NO_X emissions standard (g/bhp-hr)	
× verified percentage reduction from baseline	
= reduced NO_X emissions factor (g/bhp-hr)	
Option B. Reduced-emissions engine certified to a specific emissions standard (g/bhp-hr)	
Certified NO_X emissions (g/bhp-hr)	

Step 2. Calculate the NO_x Emissions Reduction

Baseline		Reduced Emissions	
NO_X emissions factor (g/bhp-hr)		NO_X emissions factor (g/bhp-hr)	
× TxLED correction factor (*diesel engines only*)		× TxLED correction factor (*diesel engines only*)	
= corrected NO_X emissions factor (g/bhp-hr)		= corrected NO_X emissions factor (g/bhp-hr)	
× energy consumption factor (hp-hr/gal)		× energy consumption factor (hp-hr/gal)	
× annual fuel consumption (gal/yr)		× annual fuel consumption (gal/yr)	
= grams per year (g/yr)		= grams per year (g/yr)	
Baseline g/yr – reduced emissions g/yr =			
× percent within eligible counties (%)			
= grams per year reduced (g/yr)			
		÷ 907,200 grams per ton	
= estimated annual NO_X emissions reduction (tons/yr)			
× activity life (years)			
= estimated activity-life NO_X emissions reduction (tons)			

Calculating Cost-Effectiveness

Only the amount of incentive funds requested under the program can be used in the cost-effectiveness calculation for on-road heavy-duty vehicles. The incremental costs for each activity must be reduced by the value of any existing financial incentive that directly reduces the cost of the proposed activity, including tax credits or deductions, other grants, or any other public financial assistance.

To determine the cost-effectiveness of an activity—with the exception of qualifying fuel activities—the incentive amount for the activity included in the project must be amortized over the activity life designated by the applicant, at a discount rate of 3 percent.

The following amortization formula yields a *capital-recovery factor* (CRF).

$$\text{capital-recovery factor} = \mathbf{[(1 + i)^n (i)] / [(1 + i)^n - 1]}$$

where i = discount rate (3 percent)
n = activity life

The discount rate of 3 percent reflects the opportunity cost of public funds—the level of earning that reasonably could be expected by investing state funds in various financial instruments, such as U.S. Treasury securities.

The incentive amount should be multiplied by the incremental cost, or incentive amount requested, to determine the annualized cost.

$$\textit{Incremental cost} \times \textit{CRF} = \textit{annualized cost}$$

The cost-effectiveness calculations are presented in Table A1.3. Capital-recovery factors for use in calculations for up to 20 years are presented in Table A1.4.

Table A1.3
Calculating Cost-Effectiveness

Step 1. Determine the capital-recovery factor (CRF)	
CRF = $[(1 + i)^n (i)] / [(1 + i)^n - 1]$ i = discount rate (.03) n = activity life	
Capital-recovery factor:	
Step 2. Determine the annualized cost	
Incentive amount × CRF = annualized cost	
Annualized cost ($/year):	
Step 3. Determine cost-effectiveness	
Annualized cost ($/year) / annual NO_x emissions reduction (tons/year) = cost-effectiveness ($/ton)	
Cost-effectiveness ($/ton):	$

Table A1.4
Capital-Recovery Factors Using a Discount Rate of 0.03

Activity Life	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
CRF	1.00	.5226	.3535	.2690	.2184	.1846	.1605	.1425	.1284	.1172
Activity Life	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
CRF	.1081	.1005	.0940	.0885	.0838	.0796	.0760	.0727	.0698	.0672

For projects that include more than one activity, the total project incentive amount must be used to determine the cost-effectiveness of the project. The applicant may request an incentive amount that is less than the full incremental costs, in order to meet the cost-effectiveness criteria.

To determine the cost-effectiveness: First sum all of the annualized costs for the activities included in the project. Also sum the annual emissions reductions of each activity should also be added together to determine an annual emissions reduction for the project. Then divide the combined annualized costs for all activities included in the project application by the total annual NO_X emissions reductions for the combined project activities.

Total annualized cost / total annual NO_X reductions = project cost-effectiveness

Appendix 2
Non-Road Equipment

The methods for calculating the NO_X emissions reductions for a non-road equipment project are included in this section. The emissions standards and emissions factors applicable to this program are included in a technical supplement, which will be made available in conjunction with these guidelines at the TERP Web site, <www.terpgrants.org>. Examples of the calculations will also be available in the supplement, along with other materials prepared by the TCEQ. Potential grant applicants may also contact the TCEQ for hard copies of the supplement and for answers to questions about the applicable emissions standards and factors.

Eligible Activities and Costs

The activities and eligible costs under each project category are explained in this section. The TCEQ may further limit the types of eligible activities, and may more narrowly define eligibility requirements, during a particular funding period, as needed to best achieve the goals of the TERP. Administrative costs, in-house labor costs, and travel costs are not eligible expenses.

Purchase or Lease of Non-Road Equipment

This category is for the purchase or lease of new non-road equipment. The cost may also include the purchase and installation of a global positioning system, subject to approval by the TCEQ. For this category, the TCEQ does not consider whether the applicant is replacing an existing piece of equipment, and the baseline for comparison of emissions is the current federal NO_X emissions standard for a non-road engine of that horsepower. The baseline non-road equipment used for determining the difference in cost must be new equipment.

To be eligible for funding, the engine on the new piece of equipment must be certified to emit at least 25 percent less NO_X than required (in other words, no more than 75 percent of the NO_X allowable) under the current federal standard for a non-road engine of that horsepower. "Certification" means approval by the EPA or the CARB, or acceptance on other grounds by the TCEQ.

A *lease* is defined as the use and control of a new piece of non-road equipment in accordance with a lease contract for a period of five or more years. The TCEQ will reimburse the incremental costs of the lease—costs above those that would otherwise have been incurred for the lease of a baseline vehicle.

The TCEQ will reimburse the incremental cost of the purchase of non-road equipment. The incremental cost is the difference between the documented dealer price of a baseline piece of equipment, or other appropriate baseline cost established by the TCEQ, and the actual cost of the cleaner equipment.

Replacement of Non-Road Equipment

This category is for the replacement of non-road equipment with a new or newer piece of non-road equipment. For this category, the applicant must be replacing a piece of equipment with a minimum of five years of remaining useful life. However, the TCEQ may establish longer activity-life requirements for any grant period. The baseline for comparison of emissions is the difference between the emissions of the equipment being replaced and the emissions of the equipment being purchased.

For a replacement project, the TCEQ will evaluate whether the equipment being replaced would have otherwise been used in the eligible counties for the period within which the emissions reductions will be claimed. Standards that apply include **all** of the following:

1. The owner must have continuously owned the equipment for a minimum of two years immediately preceding the grant application date.
2. Unless otherwise approved by the TCEQ, the equipment must have been continuously located and used in Texas over the preceding two years.
3. The equipment must be in good operational condition and capable of performing its primary function.

The TCEQ may waive the two-year ownership requirement, case by case, where the ownership of the company has changed, the assets of the company have been purchased by another company, or the company has changed names or incorporation status. The use of the equipment being replaced must not have changed.

The TCEQ may require additional documentation to verify that the equipment would have been used within the eligible counties.

The engine on the replacement equipment must be certified to emit at least 25 percent less NO_X (that is, no more than 75 percent as much NO_X) compared with the engine being replaced. “Certification” means approval by the EPA or the CARB, or acceptance on other grounds by the TCEQ.

The replacement equipment must be of the same type and should be intended for use in the same application or vocation (for example, excavator, compactor, grader) as the equipment being replaced. The TCEQ may accept, on a case-by-case basis, equipment of a different type to account for the latest technology used for a specific vocation.

The grant recipient may be eligible for reimbursement of up to 80 percent of the eligible costs for the purchase or lease of the replacement equipment, not to exceed an incentive amount that results in a cost-effectiveness of $15,000 or less per ton of NO_X reduced. The cost may also include the purchase and installation of a global positioning system, subject to approval by the TCEQ. The TCEQ may further limit the incentive amount to a cost-effectiveness lower than $15,000 per ton for particular funding periods, as needed to best achieve the goals of the TERP.

Costs may include the invoice price, including taxes and delivery charges included in the price of the replacement equipment, or the cash basis for the lease charges. Delivery charges from a third party, not included in the invoice price from the vehicle or equipment vendor, may be included, subject to approval by the TCEQ.

The total incentive amount also must not exceed 80 percent of the cost of the replacement equipment minus the scrappage value received for the old equipment. The TCEQ may establish a default scrappage value.

Repower of Non-Road Equipment

This category is for the replacement of an existing engine on a non-road piece of equipment with a new, rebuilt, or remanufactured engine. The engine must be certified to emit at least 25 percent less NO_X (that is, no more than 75 as much NO_X) as compared with the engine being replaced. “Certification” means approval by the EPA or the CARB, or acceptance on other grounds by the TCEQ.

Eligible rebuilt or remanufactured engines must use original-engine-manufacturer components only and be purchased from the OEM or its authorized dealers and distributors. However, the TCEQ may accept engines from suppliers not connected with the OEM, subject to a case-by-case determination.

The TCEQ will reimburse the incremental cost of the replacement engine—the cost to purchase and install the replacement engine and associated equipment

minus the scrappage value received for the old engine. The TCEQ may establish a default scrappage value.

Expenses for salaries, travel, and overhead, including indirect costs, will not be covered. Costs that may be reimbursed, subject to approval by the TCEQ, include:

- the invoice cost of the new engine, including sales tax and delivery charges;
- the invoice cost of additional equipment that must be installed with the new engine;
- associated supplies directly related to the installation of the engine;
- costs to remove and dispose of the old engine;
- installation costs;
- reengineering costs, if the vehicle or equipment must be modified for the new engine to fit; and
- other costs directly related to the project.

Retrofit or Add-On of Emissions-Reduction Technology

This category is for the retrofit of an existing engine on a non-road piece of equipment, or adding devices onto the equipment.

To be eligible for funding, the retrofit or add-on systems must be verified to emit at least 25 percent less NO_X (that is, no more than 75 as much NO_X) as compared with the engine prior to the retrofit or add-on. "Verification" means approval by the EPA or the CARB, or acceptance on other grounds by the TCEQ.

The TCEQ will reimburse the incremental cost of the purchase and installation of the retrofit or add-on technology. If the engine is to be rebuilt to install the emissions-reduction devices, the incremental cost is the difference between the cost of rebuilding the existing engine and the cost of rebuilding the engine to include the retrofit or add-on technology. If the engine does not need to be rebuilt in conjunction with installing the new technology, then the incremental cost will be the full cost of purchasing and installing the technology.

Expenses for salaries, travel, and overhead, including indirect costs, will not be covered. Costs that may be reimbursed, subject to approval by the TCEQ, include:

- the invoice cost of the retrofit kit or add-on devices, including sales tax and delivery charges;
- costs of associated supplies directly related to the installation of the devices;
- installation costs;

- reengineering costs, if the vehicle or equipment must be modified for the retrofit or add-on devices to be installed and used; and
- other costs directly related to the project, including the purchase and installation of a global positioning system.

Project Criteria

In addition to the eligibility criteria previously presented, the following list of criteria applies to projects involving non-road equipment activities. The TCEQ may impose additional criteria, and may more narrowly define the criteria established in this guide during a particular funding period, as needed to best achieve the goals of the TERP.

- One or more eligible **activities** of the same project type (i.e., on-road, non-road, locomotive, etc.) that will occur in the same primary area may be included under one project application.
- The applicant must own the equipment being replaced, repowered, or retrofitted.
- Vehicles and equipment used primarily for competition or recreation are not eligible for funding under any of the project categories.
- Non-road equipment activities must reduce NO_X emissions compared to baseline NO_X emissions. The NO_X emissions of equipment, engines, and retrofit or add-on devices used to achieve the emissions reductions must be certified or verified by the EPA or the CARB, or otherwise accepted by the TCEQ. Where the model year of the equipment and the model year of the existing engine are different—such as equipment that has already had the engine replaced with a newer engine—the model year of the engine must be used to determine the baseline emissions standard for emissions-reduction calculations. The application of the "25 percent reduction" criterion for each type of activity is explained below.

  Purchases and leases are allowed based on what year the purchase or lease is completed. At a minimum, the equipment and engine being purchased or leased must be certified to emit at least 25 percent less NO_X (in other words, no more than 75 percent as much NO_X) as compared with the current federal NO_X emissions standard for that engine.

  Replacements. The replacement equipment and engine must have been certified to emit at least 25 percent less NO_X than the engine being replaced.

  Repowers. The replacement engine must be certified to emit at least 25 percent less NO_X than the engine being replaced.

Retrofits and add-ons. Emissions standards for retrofit and add-on activities are based on the engine being retrofitted. The retrofit or add-on technology must be verified to emit at least 25 percent less NO_X than the federal standard for the engine being retrofitted.

Combined technologies. Where two technologies (for example, repower plus retrofit) are combined on the same equipment, engine, or both, the TCEQ may consider the combined reductions from the two technologies in meeting the 25 percent requirements. This decision will be solely at the discretion of the TCEQ, and will be based on its determination that the combination of the two technologies will permanently reduce emissions by at least 25 percent.

- The cost-effectiveness of a project, other than a demonstration project, must not exceed $15,000 per ton of NO_X emissions reduced in the eligible counties for which the project is proposed. Individual activities included under a single project application may exceed that amount, but the combined project must meet the cost-effectiveness standard.
- Infrastructure activities—including infrastructure costs that are part of a broader repower, retrofit, replacement or add-on project—are excluded from the cost-effectiveness limit of $15,000 per ton.
- In the areas of the state where Texas Low Emission Diesel (TxLED) is required, the baseline and reduced emissions rate calculations for diesel-engine usage after September 2005 must be adjusted using a correction factor, in addition to any other calculation adjustments.

Figure A2.1
Correction Factor for TxLED

The TCEQ adopted rules (30 TAC 114.312–319) requiring that diesel fuel sold or supplied for use in compression-ignition engines in certain counties in Texas must meet low-emission-diesel standards.

The counties affected by the TxLED requirements currently include all of the counties eligible for TERP incentive funding, as listed in Table 3.1, except for El Paso County.

The requirements set a maximum for content of aromatic hydrocarbons of 10 percent by volume. The requirements also set a minimum cetane number for TxLED of 48.

The TxLED requirements are intended to result in reductions in NO_x emissions from diesel engines. Currently, reduction factors of **5.7 percent** (0.057) for on-road use and **7.0 percent** (0.07) for non-road use have been accepted as estimates for use of TxLED. However, this reduction estimate is subject to change, based on the standards accepted by the EPA for use in the Texas State Implementation Plan. The TCEQ will identify the appropriate reduction factor to use in the technical supplement prepared to support these guidelines.

For activities in the applicable counties, a correction factor will need to be applied when calculating the baseline or reduced emissions for diesel engines.

On-road:
TxLED correction factor = 1 – 0.057 = ***0.943***

Non-road:
TxLED correction factor = 1 – 0.070 = ***0.93***

- An activity is not eligible if it is required by any state or federal law, rule, regulation, memorandum of agreement, or other legally binding document. However, this restriction does not apply to an otherwise qualified activity—regardless of the State Implementation Plan's assumption that the change in equipment, vehicles, or operations will occur—if, on the date the grant is awarded, the change is not yet required by any state or federal law, rule, regulation, memorandum of agreement, or other legally binding document. This restriction also does not apply to the purchase of vehicles or equipment that are required only by local law or regulation, or by corporate controlling board policy of a public or private entity. Demonstration projects used to demonstrate a technology that may be used to comply with an emissions-reduction requirement may be funded, as long as the reductions directly attributable to the demonstration project are not used to comply with those requirements.
- An activity involving a new emissions reduction measure that would otherwise generate marketable credits under state or federal emissions-reduction credit averaging, banking, or trading programs is not eligible for funding under this program unless:

    - the activity includes the transfer of the reductions that would otherwise be marketable credits to the State Implementation Plan or

the owner or operator, as provided under Texas Health and Safety Code 386.056; and

- the reductions are permanently retired.

- The incremental cost of the proposed activity must be reduced by the value of any existing financial incentive that directly reduces the cost of the proposed activity, including tax credits or deductions, other grants, or any other public financial assistance.
- For repower activities, eligible rebuilt or remanufactured engines must use original-engine-manufacturer components only and be purchased from the OEM or its authorized dealers and distributors. However, the TCEQ may accept engines from suppliers not connected with the OEM, subject to a case-by-case determination.
- For all activities, the activity life must be a minimum of five years. The TCEQ may establish longer activity life requirements for each grant period. Except for non-road equipment used for natural gas recovery purposes, not less than 75 percent of the annual usage of the equipment must take place in one or more of the eligible counties throughout the life of the project. Leases must be for the length of the activity life. Annual usage is to be measured by either hours of operation or fuel consumption.
- Non-road equipment used for natural gas recovery purposes must be operated in the eligible counties for a sufficient amount of use over the activity life to meet the emissions reduction commitment and cost-effectiveness requirements. To qualify for this provision the primary purpose and use of the equipment must be for natural gas recovery, as determined by the TCEQ. For example, a generator used on a natural gas drill rig may qualify, but a tracked dozer used to build a road to a drill site would not.
- For most non-road equipment, annual usage is to be measured using hours of operation. For equipment without an hour meter installed and no viable mechanism for measuring the hours of operation, fuel consumption may be used as the usage factor, if accepted by the TCEQ.
- Applicants should refer to the technical supplement to these guidelines for the maximum acceptable activity life established by the TCEQ for each type of activity.
- Applicants must agree to monitor the use of grant-funded vehicles, equipment, infrastructure, and fuel, and to report to the TCEQ for the life of each grant-funded activity.
- Applicants must also agree to notify the TCEQ of any changes during the life of the following activities: termination of use; change in use, sale, transfer, or accidental or intentional destruction of grant-funded vehicles or equipment; or change in use of the qualifying fuel.
- Administrative costs and other internal costs of the grant recipient—including but not limited to personnel expenses, internal salaries, indirect costs, and travel—are not eligible. This restriction also applies to situations where the

grant recipient acts as a transporter for delivery of the grant-funded vehicle or equipment before or after its acceptance.

- Consultant fees for the preparation of a grant application, either directly or as an addition of the cost basis of the grant-funded vehicle, equipment, or engine, are not eligible for reimbursement by the TCEQ.
- Fees for a third-party consultant hired by the grant recipient to manage and administer the grant-funded activities, including coordination of the work and submission of reports and paperwork to the TCEQ for the grant recipient, are not eligible. This restriction is not intended to limit the ability of the vehicle or equipment supplier or installer to include reasonable and necessary costs for managing the work to be performed in the price of the vehicle, equipment, or installation services. The costs for professional services, including engineering and technical work, required for completion of the activity may be included, subject to the restrictions pertaining to that type of project. Per the Uniform Grant Management Standards (UGMS), the cost plus a percentage of cost method of contracting for professional services shall not be used.
- The TCEQ may impose additional criteria for certain projects and funding periods, consistent with these guidelines.

NO_X Emissions Standards

The baseline NO_X emissions standards for this program will be the federal standards for NO_X emissions applicable to the type of engine and model year. The federal NO_X emissions standards for non-road engines are listed in the technical supplement available from the TERP Program. Potential grant applicants should consult with the TCEQ to ensure they use the appropriate baseline standards.

Calculating NO_X Emissions Reductions

In general, the emissions-reduction benefit represents the difference in the emissions of a baseline engine and a reduced-emissions engine. In situations where the model year of the equipment and the model year of the current engine are different, the model year of the engine must be used to determine the baseline emissions for benefit calculations.

The emissions level is calculated by multiplying an emissions factor, an activity level, and a conversion factor, if necessary. Because conversion factors and activity levels may be expressed in different units for the existing and replacement engines, the emissions levels for the baseline and reduced-emissions engines should be calculated separately, and then differences taken to determine emissions reductions.

For most non-road applications, the activity level should be established by the annual hours of operation. For equipment without an hour meter installed, and no other mechanism to track hours of operation, the activity level should be determined based on annual fuel consumption. Emissions-reduction calculations should be consistent with the type of records maintained over the life of each activity.

Calculation of NO_X Emissions Reductions Based on Annual Hours of Operation

The calculation of emissions and emissions reductions using annual hours of operation as the usage factor is determined by the steps in Table A2.1.

Table A2.1
Calculating NO_X Emissions Reductions Based on Annual Hours of Operation

Applying the TxLED Correction Factor

The counties affected by the TxLED requirements currently include all of the counties eligible for TERP incentive funding, as listed in Table 3.1, except for El Paso County.	
TxLED correction factor for non-road: *1 – 0.07*	0.93

Step 1. Determine the Reduced NO_X Emissions Factor

Option A. Reduced-emissions technology verified to achieve a percentage reduction from the baseline	
Baseline NO_X emissions factor (g/bhp-hr)	
× verified percentage reduction from baseline	
= reduced NO_X emissions factor (g/bhp-hr)	
Option B. Reduced-emissions engine certified to a specific emissions standard (g/bhp-hr)	
Certified NO_X emissions (g/bhp-hr)	

Step 2. Calculate the NO_x Emissions Reduction

Baseline		Reduced Emissions	
NO_X emissions factor (g/bhp-hr)		NO_X emissions factor (g/bhp-hr)	
× TxLED correction factor (*diesel engines only*)		× TxLED correction factor (*diesel engines only*)	
= corrected NO_X emissions factor (g/bhp-hr)		= corrected NO_X emission factor (g/bhp-hr)	
× load factor		× load factor	
× horsepower		× horsepower	
= grams per hour (g/hr)		= grams per hour (g/hr)	
Baseline g/hr – reduced emissions g/hr =			
× annual hours of operation			
× percent within eligible counties (%)			
= grams per year reduced (g/year)			
		÷ 907,200 grams per ton	
= estimated annual NO_X emissions reduction (tons/yr)			
× activity life (years)			
= estimated activity-life NO_X emissions reduction (tons)			

Appropriate baseline NO_X emissions factors and default load factors are included in the technical supplement to these guidelines. Use the emissions factors associated with engine horsepower and model year. Use the load factor associated with the type of equipment. Potential grant applicants should consult with the TCEQ to ensure they use the appropriate factors.

For retrofit and add-on activities, as well as other activities where the emissions reductions are based on a percentage reduction from the baseline, the verified percentage reduction factor can be applied to the baseline emissions factor to determine the reduced NO_X emissions factor.

Alternatively, for activities where the emissions of the new or replacement engine are certified at a specific emissions level (g/bhp-hr), such as purchases or repowers, use that emissions level as the emissions factor.

Calculation of NO_X Emissions Reductions Based on Annual Fuel Use

If the annual fuel consumption is used, the activity level should be based on actual annual fuel receipts or other available documentation to estimate the expected annual fuel use of the equipment. An energy consumption factor must also be calculated. The energy consumption factor converts the emissions factor in terms of g/bhp-hr to g/gal of fuel used. There are two ways of calculating the energy consumption factor:

1. by dividing the hp of the engine by the fuel economy in gal/hr; or
2. by dividing the density of the fuel by the brake-specific fuel consumption of the baseline engine.

Check with your equipment dealer to confirm the fuel economy or fuel consumption of the equipment for the type of application.

Default fuel consumption rate factors may be included in the technical supplement to these guidelines.

The calculation of NO_X emissions reductions using annual fuel use is outlined in Table A2.2. Applicants should consult with the TCEQ for the appropriate calculations for projects involving non-diesel engines.

Table A2.2
Calculating NO_X Emissions Reductions Based on Annual Fuel Use

Applying the TxLED Correction Factor

The counties affected by the TxLED requirements currently include all of the counties eligible for TERP incentive funding, as listed in Table 3.1, except for El Paso County.	
TxLED correction factor for non-road: *1 – 0.07*	0.93

Step 1. Determine the Reduced NO_X Emissions Factor

Option A. Reduced-emissions technology verified to achieve a percentage reduction from the baseline	
Baseline NO_X emissions factor (g/bhp-hr)	
× verified percentage reduction from baseline	
= reduced NO_X emissions factor (g/bhp-hr)	
Option B. Reduced-emissions engine certified to a specific emissions standard (g/bhp-hr)	
Certified NO_X emissions (g/bhp-hr)	

Step 2. Calculate the NO_X Emissions Reduction

Baseline		Reduced Emissions	
NO_X emissions factor (g/bhp-hr)		NO_X emissions factor (g/bhp-hr)	
× TxLED correction factor *(diesel engines only)*		× TxLED correction factor *(diesel engines only)*	
= corrected NO_X emissions factor (g/bhp-hr)		= corrected NO_X emissions factor (g/bhp-hr)	
× energy consumption factor (hp-hr/gal)		× energy consumption factor (hp-hr/gal)	
× annual fuel consumption (gal/yr)		× annual fuel consumption (gal/yr)	
= grams per year (g/yr)		= grams per year (g/yr)	
Baseline g/yr – reduced emissions g/yr =			
× percent within eligible counties (%)			
= grams per year reduced (g/yr)			
		÷ 907,200 grams per ton	
= estimated annual NO_X emissions reduction (tons/yr)			
× activity life (years)			
= estimated activity-life NO_X emissions reduction (tons)			

Calculating Cost-Effectiveness

Only the amount of incentive funds requested under the program can be used in cost-effectiveness calculations. The incremental costs for each activity must be reduced by the value of any existing financial incentive that directly reduces the cost of the proposed activity, including tax credits or deductions, other grants, or any other public financial assistance.

To determine the cost-effectiveness of an activity—with the exception of qualifying fuel activities—the incentive amount for the activity included in the project must be amortized over the activity life designated by the applicant, at a discount rate of 3 percent.

The following amortization formula yields a *capital-recovery factor* (CRF).

$$\text{capital-recovery factor} = \mathbf{[(1 + i)^n (i)] / [(1 + i)^n - 1]}$$

where i = discount rate (3 percent)
n = activity life

The discount rate of 3 percent reflects the opportunity cost of public funds—the level of earning that reasonably could be expected by investing state funds in various financial instruments, such as U.S. Treasury securities.

The incentive amount should be multiplied by the incremental cost or incentive amount requested to determine the annualized cost.

$$\textit{Incremental cost} \times \textit{CRF} = \textit{annualized cost}$$

The cost-effectiveness calculations are presented in Table A2.3. For use in the calculations, capital-recovery factors for up to 20 years are presented in Table A2.4.

Table A2.3
Calculating Cost-Effectiveness

Step 1. Determine the capital-recovery factor (CRF)	
$CRF = [(1 + i)^n (i)] / [(1 + i)^n - 1]$ i = discount rate (.03) n = activity life	
Capital-recovery factor:	
Step 2. Determine the annualized cost	
Incentive amount × CRF = annualized cost	
Annualized cost ($/year):	
Step 3. Determine cost-effectiveness	
Annualized cost ($/year) / annual NO_X emissions reduction (tons/year) = cost-effectiveness ($/ton)	
Cost-effectiveness ($/ton):	$

Table A2.4
Capital-Recovery Factors Using a Discount Rate of 0.03

Activity Life	1	2	3	4	5	6	7	8	9	10
CRF	1.00	.5226	.3535	.2690	.2184	.1846	.1605	.1425	.1284	.1172
Activity Life	11	12	13	14	15	16	17	18	19	20
CRF	.1081	.1005	.0940	.0885	.0838	.0796	.0760	.0727	.0698	.0672

For projects that include more than one activity, the total project incentive amount must be used to determine the cost-effectiveness of the project. The applicant may request an incentive amount that is less than the full incremental costs, in order to meet the cost-effectiveness criteria.

To determine the cost-effectiveness: First sum all of the annualized costs for the activities included in the project. Also sum the annual emissions reductions of each activity should also be added together to determine an annual emissions reduction for the project. Then divide the combined annualized costs for all activities included in the project application by the total annual NO_X emissions reductions for the combined project activities.

Total annualized cost / total annual NO_X reductions = project cost-effectiveness

Appendix 3
Marine Vessels

The methods for calculating the NO_X emissions reductions for a marine-vessel project are included in this section. Most of the calculations will require input of a NO_X emissions factor applicable to the engine. The emissions standards and emissions factors applicable to this program are included in a technical supplement, which will be made available in conjunction with these guidelines at the TERP Web site, <www.terpgrants.org>. Examples of the calculations will also be available in the supplement, along with other materials prepared by the TCEQ. Potential grant applicants may also contact the TCEQ for hard copies of the supplement and for answers to questions about the applicable emissions standards and factors.

Eligible Activities and Costs

The activities and eligible costs under each project category are explained in this section. The TCEQ may further limit the types of eligible activities, and may more narrowly define eligibility requirements, during a particular funding period, as needed to best achieve the goals of the TERP.

The types of vessels that may be eligible for funding are diverse, and may include both oceangoing vessels and harbor craft. However, to be eligible for funding, at least 75 percent of a vessel's annual use must occur in the bays adjacent to an eligible county, or in the Texas Intracoastal Waterway. Therefore, it is expected that there will be few projects involving large oceangoing vessels.

The TCEQ may also consider, case by case, vessels that operate in coastal or international waters, where it can be definitively shown that the emissions from those vessels are included by the TCEQ in the inventory of emissions for an eligible county or area made up of eligible counties. This decision will be solely at the discretion of the TCEQ. It is recommended that potential applicants contact the TCEQ to discuss this type of project before submitting an application.

In addition, many marine vessels will have one or more propulsion engines, as well as one or more auxiliary engines. In most cases, for lease or purchase and replacement projects, the combined NO_X emissions for both the propulsion and the auxiliary engine will be used to determine the NO_x emissions reductions for the project. For engine repower, retrofit, and add-on projects, the NO_X emissions reductions will be based on the individual engines being replaced or retrofitted.

This section explains the eligible activities and costs under each project category. The TCEQ may further limit the types of eligible activities, and may more narrowly define eligibility requirements under a particular funding round, or by geographic area, as needed to best achieve the objectives of the TERP. Administrative costs, in-house labor costs, and travel costs are not eligible expenses.

Purchase or Lease of Marine Vessels

This category is for the purchase or lease of new marine vessels. The cost may also include the purchase and installation of a global positioning system, subject to approval by the TCEQ. For this category, the TCEQ does not consider whether the applicant is replacing an existing piece of equipment; the baseline for comparison of emissions is the current NO_X standard for a marine engine of that horsepower and use. The baseline vessel used for determining the difference in cost must be a "new" vessel.

To be eligible for funding, the engine on the new piece of equipment must be certified to emit at least 25 percent less NO_X than required (in other words, no more than 75 percent as much NO_X as is allowable) under the current standard for that engine.

A *lease* is defined as the use and control of a new marine vessel in accordance with a lease contract for a period of five or more years. The TCEQ will reimburse the incremental costs of the lease—costs above those that would otherwise have been incurred for the lease of a baseline vessel.

The TCEQ will reimburse the incremental cost of the purchase of a new marine vessel. The incremental cost is the difference between the documented dealer price of a baseline vessel or other appropriate baseline cost established by the TCEQ and the actual cost of the cleaner vessel.

Replacement of Marine Vessels

This category is for the replacement of marine vessels with a new or newer marine vessel. For this category, the applicant must be replacing a vessel with a minimum of five years of remaining useful life. The TCEQ may establish longer activity-life requirements for any grant period. The baseline for comparison of emissions is the difference between the emissions standard (or in some cases, the certified emissions level) for the engine or engines on the vessel being replaced, and the certified emissions level of the engine or engines installed on the vessel being purchased.

For a replacement project, the TCEQ will evaluate whether the vessel being replaced would have otherwise been used in the bays adjacent to the eligible

counties or in the Texas portion of the Gulf Intracoastal Waterway for the period within which the emissions reductions will be claimed. Standards that apply include **all** of the following:

1. The owner must have owned the vessel continuously for a minimum of two years immediately preceding the grant application date.
2. Unless otherwise approved by the TCEQ, the vessel must have been continuously located and used in Texas over the preceding two years.
3. The vessel must currently be registered for operation in Texas in the applicant's name.
4. The vessel must be in good operational condition and capable of performing its primary function.

The TCEQ may waive the two-year ownership requirement, case by case, where the ownership of the company has changed, the assets of the company have been purchased by another company, or the company has changed names or incorporation status. The use of the vessels being replaced must not have changed.

Additional documentation to verify that the vessel would have been used within the bays adjacent to the eligible counties or in the Texas portion of the Gulf Intracoastal Waterway may be required.

The combined NO_X emissions of the engines on the replacement vessel must be certified to be at least 25 percent less than (that is, no more than 75 percent as much as) the combined NO_X emissions of the engines on the vessel being replaced, based on the emissions standard for those engines. “Certification” means approval by the EPA or the CARB, or acceptance on other grounds by the TCEQ.

The replacement vessel must be of the same type and should be intended for use in the same application or vocation (for example, tug, fireboat, pusher) as the vessel being replaced.

The grant recipient may be eligible for reimbursement of up to 80 percent of the eligible costs for the purchase or lease of the replacement vessel, not to exceed an incentive amount that results in a cost-effectiveness of $15,000 or less per ton of NO_X reduced. The TCEQ may further limit the incentive amount to a cost-effectiveness lower than $15,000 per ton for particular funding periods, as needed to best achieve the goals of the TERP.

Costs may include the invoice price, including taxes and delivery charges included in the price of the replacement vessel, or the cash basis for the lease charges. The cost may also include the purchase and installation of a global positioning system, subject to approval by the TCEQ. Delivery charges from a third party, not included in the invoice price from the vehicle or equipment vendor, may be included, subject to approval by the TCEQ.

The total incentive amount must not exceed 80 percent of the cost of the replacement vessel minus the scrappage value received for the old vessel. The TCEQ may establish a default scrappage value.

Repower of Marine Vessels

This category is for the replacement of an existing engine on a marine vessel with a new, rebuilt, or remanufactured engine. The replacement, rebuilt, or remanufactured engine must be certified to emit at least 25 percent less NO_X (in other words, no more than 75 percent as much NO_X) compared with the engine being replaced, or the engine before rebuilding or remanufacture, based on the standard for that engine. "Certification" means approval by the EPA, the CARB, or acceptance on other grounds by the TCEQ.

Eligible rebuilt or remanufactured engines must use original-engine-manufacturer components only and be purchased from the OEM or its authorized dealers and distributors. However, the TCEQ may accept engines from suppliers not connected with the OEM, subject to a case-by-case determination.

The TCEQ will reimburse the incremental cost of the replacement engine—the cost to purchase and install the replacement engine and associated equipment minus the scrappage value received for the old engine. The TCEQ may establish a default scrappage value.

Expenses for salaries, travel, and overhead, including indirect costs, will not be covered. Costs that may be reimbursed, subject to approval by the TCEQ, include:

- the invoice cost of the new engine, including sales tax and delivery charges;
- the invoice cost of additional equipment that must be installed with the new engine;
- associated supplies directly related to the installation of the engine;
- costs to remove and dispose of the old engine;
- installation costs;
- reengineering costs, if the vessel must be modified for the new engine to fit; and
- other costs directly related to the project, including the purchase and installation of a global positioning system.

Retrofit or Add-On of Emissions-Reduction Technology

This category is for the retrofit of an existing engine on a marine vessel, or for adding devices onto the vessel. To be eligible for funding, the retrofit or add-on systems must be verified to cause the engine to emit at least 25 percent less NO_X (that is, no more than 75 percent as much NO_X) compared with prior to the retrofit or add-on. Certification means approval by the EPA or the CARB, or acceptance on other grounds by the TCEQ.

The TCEQ will reimburse the incremental cost of the purchase and installation of the retrofit or add-on technology. If the engine is to be rebuilt to install the emissions-reduction devices, the incremental cost is the difference between the cost of rebuilding the existing engine and the cost of rebuilding the engine to include the retrofit or add-on technology. If the engine does not need to be rebuilt in conjunction with installing the new technology, then the incremental cost will be the full cost of purchasing and installing the technology.

Expenses for salaries, travel, and overhead, including indirect costs, will not be covered. Costs that may be reimbursed, subject to approval by the TCEQ, include:

- the invoice cost of the retrofit kit or add-on devices, including sales tax and delivery charges;
- the cost of associated supplies directly related to the installation of the devices;
- installation costs;
- reengineering costs, if the marine vessel must be modified for the retrofit or add-on devices to be installed and used; and
- other costs directly related to the project, including the purchase and installation of a global positioning system.

Project Criteria

In addition to the eligibility criteria previously presented, the following list of criteria applies to projects involving marine vessels. The TCEQ may impose additional criteria, and may more narrowly define the criteria established in this guide, under a particular funding round, or by geographic area, as needed to best achieve the goals of the TERP.

- One or more eligible **activities** of the same project type (i.e., on-road, non-road, locomotive, etc.) and that will occur in the same primary area may be included under one project application.
- The applicant must own the vessel being replaced, repowered, or retrofitted.

- Marine vessels used primarily for competition or recreation are not eligible for funding.
- Marine vessel activities must reduce emissions of NO_X by at least a 25 percent compared to baseline NO_X emissions. The NO_X emissions of engines and retrofit or add-on devices used to achieve the emissions reductions must be certified or verified by the EPA or the CARB, or accepted on other grounds by the TCEQ. Where the model year of the marine vessel and the model year of the existing engine are different—such as in a vessel that has already had its engine replaced with a newer engine—the model year of the engine must be used to determine the baseline emissions standard for emissions-reduction calculations. The application of the 25 percent reduction criteria for each type of activity is explained below.

  Purchases and leases are allowed based on what year the purchase or lease is completed. At a minimum, the combined NO_X emissions of the vessel being purchased or leased must be certified to be at least 25 percent less than the NO_X emissions would have been if the engine(s) only met the minimum standard.

  Replacements. The replacement combined certified NO_x emissions of the replacement marine vessel must be at least 25 percent less than the combined NO_X emissions of the vessel being replaced, based on the emissions standards for those engines.

  Repowers. The replacement engine must be certified to emit at least 25 percent less NO_X than the engine being replaced, based on the federal standard for that engine.

  Retrofits and add-ons. Emissions standards for retrofit and add-on activities are based on the engine being retrofitted. If an applicant wants to retrofit or add on a device, the technology must be verified to emit at least 25 percent less NO_X than the standard for the engine being retrofitted.

Combined technologies. Where two technologies (for example, repower plus retrofit) are combined on the same vessel or engine, the TCEQ may consider the combined reductions from the two technologies in meeting the 25 percent requirements. This decision will be solely at the discretion of the TCEQ, and will be based on a determination that the combination of the two technologies will permanently reduce emissions by at least 25 percent.

- The cost-effectiveness of a project, other than a demonstration project, may not exceed $15,000 per ton of NO_X emissions reduced in the eligible counties for which the project is proposed. Individual activities included under a single project application may exceed this amount, but the combined project must meet the cost-effectiveness standard.
- Infrastructure activities—including infrastructure costs that are part of a cost-effectiveness limit for a broader repower, retrofit, replacement or add-on project—are excluded from the $15,000 per ton.
- An activity is not eligible if it is required by any state or federal law, rule, regulation, memorandum of agreement, or other legally binding document. However, this restriction does not apply to an otherwise qualified activity—regardless of the State Implementation Plan's assumption that the change in equipment, vehicles, or operations will occur—if, on the date the grant is awarded, the change is not yet required by any state or federal law, rule, regulation, memorandum of agreement, or other legally binding document. This restriction also does not apply to the purchase of vehicles or equipment that is required only by local law or regulation or by corporate or controlling board policy of a public or private entity. Demonstration projects used to demonstrate a technology that may be used to comply with an emissions reduction requirement may be funded, as long as the reductions directly attributable to the demonstration project are not used to comply with those requirements.
- Activities for the repower or retrofit of an existing engine that must meet a more stringent emissions standard under state or federal regulations at the time of engine replacement, overhaul, or remanufacture may also be eligible if the requirement does not include a deadline or specific time period for the upgrade to occur. The more stringent emissions standard will be used as the baseline emissions rate in the calculation to determine the emissions reductions and the determination that the activity will result in at least a 25 percent reduction in NO_X.
- In the areas of the state where Texas Low Emission Diesel is required the baseline and reduced emissions-rate calculations for diesel engine usage after September 2005 must be adjusted using a correction factor, in addition to any other calculation adjustments.

Figure A3.1
Correction Factor for TxLED

The TCEQ adopted rules (30 TAC 114.312–319) requiring that diesel fuel sold or supplied for use in compression-ignition engines in certain counties in Texas must meet low-emission-diesel standards.

The counties affected by the TxLED requirements currently include all of the counties eligible for TERP incentive funding, as listed in Table 3.1, except for El Paso County.

The requirements set a maximum for content of aromatic hydrocarbons of 10 percent by volume. The requirements also set a minimum cetane number for TxLED of 48.

The TxLED requirements are intended to result in reductions in NO_x emissions from diesel engines. Currently, reduction factors of **5.7 percent** (0.057) for on-road use and **7.0 percent** (0.07) for non-road use have been accepted as estimates for use of TxLED. However, this reduction estimate is subject to change, based on the standards accepted by the EPA for use in the Texas State Implementation Plan. The TCEQ will identify the appropriate reduction factor to use in the technical supplement prepared to support these guidelines.

For activities in the applicable counties, a correction factor will need to be applied when calculating the baseline or reduced emissions for diesel engines.

On-road:
TxLED correction factor = 1 – 0.057 = ***0.943***

Non-road:
TxLED correction factor = 1 – 0.070 = ***0.93***

- An activity involving a new emissions-reduction measure that would otherwise generate marketable credits under state or federal emissions-reduction-credit averaging, banking, or trading programs is not eligible for funding under this program unless:
  - the activity includes the transfer of the reductions that would otherwise be marketable credits to the State Implementation Plan or the owner or operator as provided under Texas Health and Safety Code 386.056; and
  - the reductions are permanently retired.
- The incremental cost of the proposed activity must be reduced by the value of any existing financial incentive that directly reduces its cost, including tax credits or deductions, other grants, or any other public financial assistance.
- For repower activities, eligible rebuilt or remanufactured engines must use original-engine-manufacturer components only and be purchased from the OEM or its authorized dealers and distributors. However, the TCEQ may accept engines from suppliers not connected with the OEM, subject to a case-by-case determination.
- For all activities, the activity life must be a minimum of five years. The TCEQ may establish longer activity life requirements for each grant period. Not less than 75 percent of the annual use of the marine vessel must take place in the

Texas portion of the Gulf Intracoastal Waterway or in bays adjacent to an eligible county throughout the life of the project.

- For most marine vessels, annual use must be measured using hours of operation. For vessels with no viable mechanism for measuring the hours of operation, fuel consumption normally should be chosen as the usage factor.
- Applicants should refer to the technical supplement to these guidelines for the maximum acceptable life established by the TCEQ for each type of activity.
- Applicants must agree to monitor the use of grant-funded vehicles, equipment, infrastructure, and fuel, and to report to the TCEQ for the life of each grant-funded activity.
- Applicants must also agree to notify the TCEQ of any changes during the life of the following activities: termination of use; change in use, sale, transfer, or accidental or intentional destruction of grant-funded vehicles or equipment; or change in use of the qualifying fuel.
- Administrative costs and other internal costs of the grant recipient—including but not limited to personnel expenses, internal salaries, indirect costs, and travel—are not eligible. This restriction also applies to situations where the grant recipient acts as a transportation provider for delivery of the grant-funded vehicle or equipment before or after accepting it.
- Consultant fees for the preparation of a grant application, either directly or as an addition of the cost basis of the grant-funded vehicle, equipment, or engine, are not eligible for reimbursement by the TCEQ.
- Fees for a third-party consultant hired by the grant recipient to manage and administer the grant-funded activities, including coordination of the work and submission of reports and paperwork to the TCEQ for the grant recipient, are not eligible. This restriction is not intended to limit the ability of the vehicle or equipment supplier or installer to include reasonable and necessary costs for managing the work to be performed in the price of the vehicle, equipment, or installation services. The costs for professional services, including engineering and technical work, required for completion of the activity may be included, subject to the restrictions pertaining to that type of project. Per the Uniform Grant Management Standards, the cost plus a percentage of cost method of contracting for professional services shall not be used.
- The TCEQ may impose additional criteria for certain projects and funding periods, consistent with these guidelines.

NO_X Emissions Standards

The EPA has adopted exhaust emissions standards for marine diesel engines. These standards apply to the following:

- **Marine diesel engines with per-cylinder displacement at or above 30 liters.** These engines are also known as Category 3 marine diesel engines. They range from about 2,500 to 70,000 kilowatts (3,000 to 100,000 hp). These are very large marine diesel engines used for propulsion power on oceangoing vessels such as container ships, oil tankers, bulk carriers, and cruise ships.
- **Marine diesel engines with per-cylinder displacement between 2.5 and 30 liters.** These engines are also known as Category 1 and Category 2 marine diesel engines. They range in size from about 500 to 8,000 kilowatts (700 to 11,000 hp). These engines are used to provide propulsion power on many kinds of vessels, including tugboats, push boats, supply vessels, fishing vessels, and other commercial vessels in and around U.S. ports. They are also used as stand-alone generators for auxiliary power on many types of vessels.

For purposes of this program, the EPA standards for marine engines are to be used for propulsion engines, where applicable. These standards are included in the technical supplement to these guidelines. To determine the emissions levels for engines manufactured before the EPA standards apply to that engine, the TCEQ will work with the grant applicant to determine the most appropriate emissions level to use for that engine, based on information supplied by the manufacturer and from other sources.

For new leases and purchases, where the vessel's NO_X emissions must be at least 25 percent less than the current minimum standards, and where the EPA standards do not yet apply to the engines installed on the vessel, the TCEQ will work with the grant applicant to determine whether the engines meet the requirements for this program.

In most cases, the EPA standards for non-road engines will be used for determining the emissions of auxiliary engines on marine vessels.

For activities involving oceangoing vessels, the TCEQ will work with the grant applicant to determine the appropriate standards to use, case by case.

Calculating NO_X Emissions Reductions

In general, the emissions-reduction benefit represents the difference in the emissions level of a baseline engine and a reduced-emissions engine. In situations where the model year of the marine vessel and the model year of the current engine are different, the model year of the engine must be used to determine the baseline emissions for benefit calculations.

The emissions level is calculated by multiplying an emissions factor and an activity level. Because conversion factors and the activity levels may be expressed in different units for the existing and replacement engines, the emissions levels for the baseline and reduced-emissions engines

should be calculated separately, and then differences taken to determine emissions reductions.

For most marine applications, the activity level should be established by the annual hours of operation. For engines without an hour meter installed, and no other mechanism to track hours of operation, the activity level should be determined from annual fuel consumption. Emissions-reduction calculations should be consistent with the type of records maintained over the life of each activity.

Calculation of NO_X Emissions Reductions Based on Annual Hours of Operation

The calculation of emissions and emissions reductions using annual hours of operation as the usage factor is determined by the steps shown in Table A3.1.

Table A3.1
Calculating NO_X Emissions Reductions Based on Annual Hours of Operation

Applying the TxLED Correction Factor

The counties affected by the TxLED requirements currently include all of the counties eligible for TERP incentive funding, as listed in Table 3.1, except for El Paso County.	
TxLED correction factor for non-road: *1 – 0.07*	0.93

Step 1. Determine the Reduced NO_X Emissions Factor

Option A. Reduced-emissions technology verified to achieve a percentage reduction from the baseline	
Baseline NO_X emissions factor (g/bhp-hr)	
× verified percentage reduction from baseline	
= reduced NO_X emissions factor (g/bhp-hr)	
Option B. Reduced-emissions engine certified to a specific emissions standard (g/bhp-hr)	
Certified NO_X emissions (g/bhp-hr)	

Step 2. Calculate the NO_X Emissions Reduction

Baseline		Reduced Emissions	
NO_X emissions factor (g/bhp-hr)		NO_X emissions factor (g/bhp-hr)	
× TxLED correction factor (*diesel engines only*)		× TxLED correction factor (*diesel engines only*)	
= corrected NO_X emissions factor (g/bhp-hr)		= corrected NO_X emissions factor (g/bhp-hr)	
× horsepower		× horsepower	
= grams per hour (g/hr)		= grams per hour (g/hr)	
Baseline g/hr – reduced emissions g/hr =			
× annual hours of operation			
× percent within eligible counties (%)			
= grams per year reduced (g/year)			
		÷ 907,200 grams per ton	
= estimated annual NO_X emissions reduction (tons/yr)			
× activity life (years)			
= estimated activity-life NO_X emissions reduction (tons)			

Appropriate baseline NO_X emissions factors are included in the technical supplement available from the TCEQ. Use the emissions factors associated with engine horsepower and model year. Potential grant applicants should consult with the TCEQ to ensure they use the appropriate factors.

For retrofit and add-on activities, and other activities where the emissions reductions are based on a percentage reduction from the baseline, the verified percentage reduction factor can be applied to the baseline emissions factor to determine the reduced NO_X emissions factor.

Alternatively, for activities where the emissions of the new or replacement engine are certified at a specific emissions level (g/bhp-hr), such as purchases or repowers, that emissions level should be used as the emissions factor.

Calculation of NO_X Emissions Reductions Based on Annual Fuel Use

If annual fuel consumption is the basis for the emissions reductions, an energy consumption factor is used to convert g/bhp-hr to g/gal of fuel used. There are two ways of calculating an engine-specific energy consumption factor:

1. divide the hp of the engine by the fuel economy in gal/hr; or
2. divide the density of the fuel by the brake-specific fuel consumption of the engine.

While actual fuel receipts or other documentation may support the annual fuel consumption for an engine being replaced, repowered, or retrofitted, the annual fuel consumption of the new vehicle or engine is an estimate, proportional to the change in the energy-consumption factor. Check with your equipment dealer to confirm the fuel economy or fuel consumption of the equipment for the type of application.

Otherwise, there are two ways of calculating an engine-specific energy consumption factor:

1. divide the hp of the engine by the fuel economy in gal/hr; or
2. divide the density of the fuel by the brake-specific fuel consumption of the engine.

While actual fuel receipts or other documentation may support the annual fuel consumption for a baseline engine, the annual fuel consumption of the new vehicle or engine is an estimated proportion to the change in the energy consumption factor. For example, a reduced-emissions engine having an energy consumption factor of 18.5, which replaces a baseline engine that uses 5,000 gallons/year, and that has an energy consumption factor of 17.8, would have an estimated annual fuel consumption of 5,197 gal/yr.

Default fuel-consumption-rate factors may be included in the technical supplement to these guidelines.

The calculation of NO_X emissions reductions using annual fuel use is outlined in Table A3.2. Applicants should consult with the TCEQ for the appropriate calculations for projects involving non-diesel engines.

Table A3.2
Calculating NO_X Emissions Reduction Based on Annual Fuel Use

Applying the TxLED Correction Factor

The counties affected by the TxLED requirements currently include all of the counties eligible for TERP incentive funding, as listed in Table 3.1, except for El Paso County.	
TxLED correction factor for non-road: *1 – 0.07*	0.93

Step 1. Determine the Reduced NO_x Emissions Factor

Option A. Reduced-emissions technology verified to achieve a percentage reduction from the baseline	
Baseline NO_X emissions factor (g/bhp-hr)	
× verified percentage reduction from baseline	
= reduced NO_X emissions factor (g/bhp-hr)	
Option B. Reduced-emissions engine certified to a specific emissions standard (g/bhp-hr)	
Certified NO_X emissions (g/bhp-hr)	

Step 2. Calculate the NO_X Emissions Reduction

Baseline		**Reduced Emissions**	
NO_X emissions factor (g/bhp-hr)		NO_X emissions factor (g/bhp-hr)	
× TxLED correction factor (*diesel engines only*)		× TxLED correction factor (*diesel engines only*)	
= corrected NO_X emissions factor (g/bhp-hr)		= corrected NO_X emissions factor (g/bhp-hr)	
× energy consumption factor (hp-hr/gal)		× energy consumption factor (hp-hr/gal)	
× annual fuel consumption (gal/yr)		× annual fuel consumption (gal/yr)	
= grams per year (g/yr)		= grams per year (g/yr)	
Baseline g/yr – reduced emissions g/yr =			
× percent within eligible counties (%)			
= grams per year reduced (g/yr)			
		÷ 907,200 grams per ton	
= estimated annual NO_X emissions reduction (tons/yr)			
× activity life (years)			
= estimated activity-life NO_X emissions reduction (tons)			

Calculating Cost-Effectiveness

Only the amount of incentive funds requested under the program will be used in cost-effectiveness calculations for marine vessels. The incremental costs for each activity must be reduced by the value of any existing financial incentive that directly reduces the cost of the proposed activity, including tax credits or deductions, other grants, or any other public financial assistance.

To determine the cost-effectiveness of an activity—with the exception of qualifying fuel activities—the incentive amount for the activity included in the project must be amortized over the activity life designated by the applicant, at a discount rate of 3 percent.

The following amortization formula yields a *capital-recovery factor* (CRF).

$$\text{capital-recovery factor} = \mathbf{[(1 + i)^n (i)] / [(1 + i)^n - 1]}$$

where i = discount rate (3 percent)
n = activity life

The discount rate of 3 percent reflects the opportunity cost of public funds—the level of earning that reasonably could be expected by investing state funds in various financial instruments, such as U.S. Treasury securities.

The incentive amount should be multiplied by the incremental cost or incentive amount requested to determine the annualized cost.

$$\textit{Incremental cost} \times \textit{CRF} = \textit{annualized cost}$$

The cost-effectiveness calculations are presented in Table A3.3. For use in the calculations, capital-recovery factors for up to 20 years are presented in Table A3.4.

Table A3.3
Calculating Cost-Effectiveness

Step 1. Determine the capital-recovery factor (CRF)	
$\text{CRF} = [(1 + i)^n (i)] / [(1 + i)^n - 1]$ i = discount rate (.03) n = activity life	
Capital-recovery factor:	
Step 2. Determine the annualized cost	
Incentive amount × CRF = annualized cost	
Annualized cost ($/year):	

Step 3. Determine cost-effectiveness	
Annualized cost ($/year) / annual NO_X emissions reduction (tons/year) = cost-effectiveness ($/ton)	
Cost-effectiveness ($/ton):	$

Table A3.4
Capital-Recovery Factors Using a Discount Rate of 0.03

Activity Life	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
CRF	1.00	.5226	.3535	.2690	.2184	.1846	.1605	.1425	.1284	.1172
Activity Life	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
CRF	.1081	.1005	.0940	.0885	.0838	.0796	.0760	.0727	.0698	.0672

For projects that include more than one activity, the total project incentive amount must be used to determine the cost-effectiveness of the project. The applicant may request an incentive amount that is less than the full incremental costs, in order to meet the cost-effectiveness criteria.

To determine the cost-effectiveness: First sum all of the annualized costs for the activities included in the project. Also sum the annual emissions reductions of each activity should also be added together to determine an annual emissions reduction for the project. Then divide the combined annualized costs for all activities included in the project application by the total annual NO_X emissions reductions for the combined project activities.

Total annualized cost / total annual NO_X reductions = project cost-effectiveness

Appendix 4
Locomotives

The methods for calculating the NO_X emissions reductions for a locomotive project are included in this section. The emissions standards and emissions factors applicable to this program are included in a technical supplement, which will be made available in conjunction with these guidelines at the TERP Web site, <www.terpgrants.org>. Examples of the calculations will also be available in the supplement, along with other materials prepared by the TCEQ. Potential grant applicants may also contact the TCEQ for hard copies of the supplement and for answers to questions about the applicable emissions standards and factors.

Eligible Activities and Costs

Locomotives are eligible for grants under this program. Most of the engines eligible under this program will be powered by diesel-fueled compression-ignition engines. However, engines powered by other fuels may also be eligible, subject to decisions by the TCEQ for particular funding periods. Eligible activities and costs under each project category are explained in this section. The TCEQ may further limit the types of eligible activities, and may more narrowly define eligibility requirements under a particular funding round or by geographic area, as needed to best achieve the goals of the TERP. Administrative costs, in-house labor costs, and travel costs are not eligible expenses.

Purchase or Lease of Locomotives

This category is for the purchase or lease of new locomotives. The cost may also include the purchase and installation of a global positioning system, subject to approval by the TCEQ. For this category, the TCEQ does not consider whether the applicant is replacing an existing locomotive, and the baseline for comparison of emissions is the current federal NO_X emissions standard for that locomotive.

To be eligible for funding, the engine on the new locomotive must be certified to emit at least 25 percent less NO_X than required (in other words, no more than 75 percent as much NO_X as is allowable) under the current federal standard for that engine.

A *lease* is defined as the use and control of a new locomotive in accordance with a lease contract for a period of five or more years. The TCEQ will reimburse the incremental costs of the lease—costs above those that would otherwise have been incurred for the lease of a baseline locomotive.

The TCEQ will reimburse the incremental cost of the purchase of a new locomotive. The incremental cost is the difference between the documented dealer price of a baseline locomotive or other appropriate baseline cost established by the TCEQ, and the actual cost of the cleaner locomotive.

The baseline locomotive used for determining the difference in cost must be a "new" locomotive certified to the current federal NO_x emission standards.

EPA has previously defined "new locomotive" to mean a freshly manufactured or remanufactured locomotive. EPA defined a "remanufacture" of a locomotive as a process in which all of the power assemblies of a locomotive engine are replaced with freshly manufactured (containing no previously used parts) or reconditioned power assemblies. The TCEQ will make the final determination regarding the applicability of a baseline new locomotive.

Replacement of Locomotives

This category is for the replacement of a locomotive with a new or newer locomotive. For this category, the applicant must be replacing a locomotive with a minimum of five years of remaining useful life. The TCEQ may establish longer activity life requirements for each grant period. The baseline for comparison is the emissions of the locomotive being replaced and the emissions of the locomotive being purchased.

For a replacement project, the TCEQ will evaluate whether the locomotive being replaced would have otherwise been used in the eligible counties for the period within which the emissions reductions will be claimed. Standards that apply include **all** of the following:

1. The owner must have continuously owned the locomotive for a minimum of two years immediately preceding the grant application date.
2. Unless otherwise approved by the TCEQ, the locomotive must have been continuously located and used in Texas over the preceding two years.
3. The locomotive must be in good operational condition and capable of performing its primary function.

The TCEQ may waive the two-year ownership requirement, case by case, where the ownership of the company has changed, the assets of the company have been purchased by another company, or the company has changed names or incorporation status. The use of the locomotives being replaced must not have changed.

The TCEQ may require additional documentation to verify that the locomotive being replaced would have been used within the eligible counties.

The engine on the replacement locomotive must be certified to emit at least 25 percent less NO_X (in other words, no more than 75 percent as much NO_X) compared with the engine being replaced. "Certification" means approval by the EPA or the CARB, or acceptance on other grounds by the TCEQ.

The replacement locomotive must be of the same type and should be intended for use in the same application or vocation (for example, switcher) as the locomotive being replaced. The TCEQ may accept, on a case by case basis, engines or equipment of a different type to account for the latest technology used for a specific vocation.

The grant recipient may be eligible for reimbursement of up to 80 percent of the eligible costs for the purchase or lease of the replacement locomotive, not to exceed an incentive amount that results in a cost-effectiveness of $15,000 or less per ton of NO_X reduced. The cost may also include the purchase and installation of a global positioning system, subject to approval by the TCEQ. The TCEQ may further limit the incentive amount to a cost-effectiveness lower than $15,000 per ton for particular funding periods, as needed to best achieve the goals of the TERP.

Costs may include the invoice price, including taxes and delivery charges included in the price of the replacement locomotive, or the cash basis for the lease charges. Delivery charges from a third party not included in the invoice price from the vehicle or equipment vendor, may be included, subject to approval by the TCEQ.

The total incentive amount also must not exceed 80 percent of the cost of the replacement locomotive minus the scrappage value received for the old locomotive. The TCEQ may establish a default scrappage value.

Repower of Locomotives

This category is for the replacement of an existing engine on a locomotive with a new, rebuilt, or remanufactured engine. The engine must be certified to emit at least 25 percent less NO_X than the engine being replaced (in other words, no more than 75 percent of the NO_X allowable), based on the federal standard for that engine. "Certification" means approval by the EPA or the CARB, or acceptance on other grounds by the TCEQ.

Eligible rebuilt or remanufactured engines must use original-engine-manufacturer components only and be purchased from the OEM or its authorized dealers and distributors. However, the TCEQ may accept engines from suppliers not connected with the OEM, subject to a case-by-case determination.

The TCEQ will reimburse the incremental cost—the cost to purchase and install the replacement engine and associated equipment minus the scrappage value received for the old engine. The TCEQ may establish a default scrappage value.

Expenses for salaries, travel, and overhead, including indirect costs, will not be covered. Costs that may be reimbursed, subject to approval by the TCEQ, include:

- the invoice cost of the new engine, including sales tax and delivery charges;
- the invoice cost of additional equipment that must be installed with the new engine;
- associated supplies directly related to the installation of the engine;
- costs to remove and dispose of the old engine;
- installation costs;
- reengineering costs, if the locomotive must be modified for the new engine to fit; and
- other costs directly related to the project, including the purchase and installation of a global positioning system.

Retrofit or Add-On of Emissions-Reduction Technology

This category is for the retrofit of an existing engine on a locomotive, or for adding devices onto the locomotive.

To be eligible for funding, the retrofit or add-on systems must be verified to reduce the NO_X produced by the engine by 25 percent or more, compared with the engine prior to the retrofit or add-on. "Certification" means approval by the EPA or the CARB, or acceptance on other grounds by the TCEQ.

The TCEQ will reimburse the incremental cost of the purchase and installation of the retrofit or add-on technology. If the engine is to be rebuilt to install the emissions-reduction devices, the incremental cost is the difference between the cost of rebuilding the existing engine and the cost of rebuilding the engine to include the retrofit or add-on technology. If the engine does not need to be rebuilt in conjunction with installing the new technology, then the incremental cost will be the full cost of purchasing and installing the technology.

Expenses for salaries, travel, and overhead, including indirect costs, will not be covered. Costs that may be reimbursed, subject to approval by the TCEQ, include:

- the invoice cost of the retrofit kit or add-on devices, including sales tax and delivery charges;
- the cost of associated supplies directly related to the installation of the devices;

- installation costs;
- reengineering costs, if the vehicle or equipment must be modified for the retrofit or add-on devices to be installed and used; and
- other costs directly related to the project, including the purchase and installation of a global positioning system.

Project Criteria

In addition to the eligibility criteria previously presented, the following list of criteria applies to projects involving locomotives. The TCEQ may impose additional criteria, and may more narrowly define the criteria established in this guide, during a particular funding period or by geographic area, as needed to best achieve the objectives of the TERP.

- One or more eligible **activities** of the same project type (i.e., on-road, non-road, locomotive, etc.) and that will occur in the same primary area may be included under one project application.
- The applicant must own the locomotive being replaced, repowered, or retrofitted.
- Locomotives used primarily for competition or recreation are not eligible for funding.
- An activity must provide a NO_X emissions reduction compared to baseline NO_X emissions. The NO_X emissions of locomotives, engines, and retrofit or add-on devices used to achieve the emissions reductions must be certified or verified by the EPA or the CARB, or otherwise accepted by the TCEQ. In situations where the model year of the locomotive and the model year of the existing engine are different—such as a locomotive that has already had the engine replaced with a newer engine—the model year of the engine must be used to determine the baseline emissions standard for emissions-reduction calculations. The application for the 25 percent reduction criterion for each type of activity is explained below.

  Purchases and leases are allowed based on what year the purchase or lease is completed. At a minimum, the locomotive and engine being purchased or leased must be certified to emit at least 25 percent less NO_X (that is, no more than 75 percent as much NO_X) compared with the current federal NO_X emissions standard for that locomotive.

  Replacements. The replacement locomotive and engine(s) must have been certified to emit at least 25 percent less NO_X than the locomotive being replaced.

  Repowers. The replacement engine must be certified to emit at least 25 percent less NO_X than the engine being replaced.

Retrofits and add-ons. Emissions standards for retrofit and add-on activities are based on the engine being retrofitted. If an applicant wants to retrofit or add on a device, the technology must be verified to emit at least 25 percent less NO_X than the federal standard for the engine being retrofitted.

Combined technologies. Where two technologies (for example, repower plus retrofit) are combined on the same locomotive, engine, or both, the TCEQ may consider the combined reductions from the two technologies in meeting the 25 percent requirement. This decision will be solely at the discretion of the TCEQ, and will be based on its determination that the combination of the two technologies will permanently reduce emissions by at least 25 percent.

- The cost-effectiveness of a project, other than a demonstration project, must not exceed $15,000 per ton of NO_X emissions reduced in the eligible counties for which the project is proposed. Individual activities included under a single project application may exceed that amount, but the combined project must meet the cost-effectiveness standard.
- Infrastructure activities—including infrastructure costs that are part of a broader repower, retrofit, replacement, or add-on project—are excluded from the cost-effectiveness limit of $15,000 per ton.
- An activity is not eligible if it is required by any state or federal law, rule, regulation, memorandum of agreement, or other legally binding document. However, this restriction does not apply to an otherwise qualified activity—regardless of the State Implementation Plan's assumption that the change in equipment, vehicles, or operations will occur—if, on the date the grant is awarded, the change is not yet required by any state or federal law, rule, regulation, memorandum of agreement, or other legally binding document. This restriction also does not apply to the purchase of vehicles or equipment that is required only by local law or regulation, or by corporate or controlling board policy of a public or private entity. Demonstration projects used to demonstrate a technology that may be used to comply with an emissions-reduction requirement may be funded, as long as the reductions directly attributable to the demonstration project are not used to comply with those requirements.
- Activities for the repower or retrofit of an existing engine that must meet a more stringent emissions standard under state or federal regulations at the time of engine replacement, overhaul, or remanufacture may also be eligible if the requirement does not include a deadline or specific time period for the upgrade to occur. The more stringent emissions standard will be used as the baseline emissions rate in the calculation to determine the emissions reductions and whether the activity will result in at least a 25 percent reduction in NO_X.
- In the areas of the state where Texas Low Emission Diesel (TxLED) is required the baseline and reduced-emissions-rate calculations for diesel-engine usage

after September 2005 mustbe adjusted using a correction factor, in addition to any other calculation adjustments.

Figure A4.1
Correction Factor for TxLED

The TCEQ adopted rules (30 TAC 114.312–319) requiring that diesel fuel sold or supplied for use in compression-ignition engines in certain counties in Texas must meet low-emission-diesel standards.

The counties affected by the TxLED requirements currently include all of the counties eligible for TERP incentive funding, as listed in Table 3.1, except for El Paso County.

The requirements set a maximum for content of aromatic hydrocarbons of 10 percent by volume. The requirements also set a minimum cetane number for TxLED of 48.

The TxLED requirements are intended to result in reductions in NO_X emissions from diesel engines. Currently, reduction factors of **5.7 percent** (0.057) for on-road use and **7.0 percent** (0.07) for non-road use have been accepted as estimates for use of TxLED. However, this reduction estimate is subject to change, based on the standards accepted by the EPA for use in the Texas State Implementation Plan. The TCEQ will identify the appropriate reduction factor to use in the technical supplement prepared to support these guidelines.

For activities in the applicable counties, a correction factor will need to be applied when calculating the baseline or reduced emissions for diesel engines.

On-road:
TxLED correction factor = 1 – 0.057 = ***0.943***

Non-road:
TxLED correction factor = 1 – 0.070 = ***0.93***

- An activity involving a new emissions-reduction measure that would otherwise generate marketable credits under state or federal emissions-reduction credit averaging, banking, or trading programs is not eligible for funding under this program unless:
  - the activity includes the transfer of the reductions that would otherwise be marketable credits to the State Implementation Plan or the owner or operator, as provided under Texas Health and Safety Code 386.056; and
  - the reductions are permanently retired.
- The incremental cost of the proposed activity must be reduced by the value of any existing financial incentive that directly reduces the cost of the proposed activity, including tax credits or deductions, other grants, or any other public financial assistance.
- For repower activities, eligible rebuilt or remanufactured engines must use original-engine-manufacturer components only and be purchased from the OEM or its authorized dealers and distributors. However, the TCEQ may

accept engines from suppliers not connected with the OEM, subject to a case-by-case determination.

- For all activities, the activity life must be for a minimum of five years. The TCEQ may establish longer activity life requirements for each grant period. Not less than 75 percent of the annual usage of the locomotive must take place in one or more of the eligible counties throughout the life of the project. Leases must be for the length of the activity life.
- Annual use normally should be measured using fuel consumption.
- Applicants should refer to the technical supplement to these guidelines for the maximum acceptable life established by the TCEQ for each type of activity.
- Applicants must agree to monitor the use of grant-funded vehicles, equipment, infrastructure, and fuel, and to report to the TCEQ for the life of each grant-funded activity.
- Applicants must also agree to notify the TCEQ of any changes during the life of the following activities: termination of use, change in use; sale, transfer, or accidental or intentional destruction of grant-funded vehicles or equipment; or change in use of the qualifying fuel.
- Administrative costs and other internal costs of the grant recipient, including but not limited to personnel expenses, internal salaries, indirect costs, and travel are not eligible. This restriction also applies to situations where the grant recipient acts as a transportation provider for delivery of the grant-funded vehicle or equipment before or after accepting it.
- Consultant fees for the preparation of a grant application, either directly or as an addition of the cost basis of the grant-funded vehicle, equipment, or engine, are not eligible for reimbursement by the TCEQ.
- Fees for a third-party consultant hired by the grant recipient to manage and administer the grant-funded activities, including coordination of the work and submission of reports and paperwork to the TCEQ for the grant recipient, are not eligible. This restriction is not intended to limit the ability of the vehicle or equipment supplier or installer to include reasonable and necessary costs for managing the work to be performed in the price of the vehicle, equipment, or installation services. The costs for professional services, including engineering and technical work, required for completion of the activity may be included, subject to the restrictions pertaining to that type of project. Per the Uniform Grant Management Standards, the cost plus a percentage of cost methods of contracting for professional services shall not be used.
- The TCEQ may impose additional criteria for certain projects and funding periods, consistent with these guidelines.

NO_X Emissions Standards

The EPA adopted emissions standards for locomotives in December 1997, which took effect in 2000. Federal standards apply to locomotives originally manufactured in 1973 and later, and apply any time they are rebuilt or remanufactured. Not regulated are electric locomotives, historic steam-powered locomotives, and locomotives originally manufactured before.

The baseline NO_X emissions standards for this program are the federal standards for NO_X emissions applicable to the type of locomotive and model year. The federal NO_X emissions standards for locomotives are listed in the technical supplement to these guidelines. Potential grant applicants should consult with the TCEQ to ensure they use the appropriate baseline standards.

Calculating NO_X Emissions Reductions

In general, the emissions-reduction benefit represents the difference in the emissions level of a baseline engine and a reduced-emissions engine. In situations where the model year of the locomotive and the model year of the current engine are different, the model year of the engine must be used to determine the baseline emissions for benefit calculations.

The emissions level is calculated by multiplying an emissions factor, an activity level, and a conversion factor, if necessary. Because conversion factors and activity levels may be expressed in different units for the existing and replacement engines, the emissions levels for the baseline and reduced-emissions engines should be calculated separately and then differences taken to determine emissions reductions.

For most locomotive applications, the activity level should be based on annual fuel consumption. Emissions-reduction calculations should be consistent with the type of records maintained over the life of each activity.

Calculation of NO_X Emissions Reductions Based on Annual Fuel Use

If the annual fuel consumption is used, the activity level should be based on actual annual fuel receipts or other available documentation to estimate the expected annual fuel use of the equipment. An energy consumption factor will also need to be calculated. The energy consumption factor converts the emissions factor in terms of g/bhp-hr to g/gal of fuel used. There are two ways of calculating the energy consumption factor:

1. by dividing the hp of the engine by the fuel economy in gal/hr; or

2. by dividing the density of the fuel by the brake-specific fuel consumption of the baseline engine.

Check with your equipment dealer to confirm the fuel economy or fuel consumption of the equipment for the type of application.

For most locomotive applications a default fuel consumption rate factor of 20.8 bhp-hr/gal should be used. The technical supplement to these guidelines will include the appropriate emissions factors, as well as any alternative fuel-consumption factors.

In general, the calculation of emissions reductions should be based on the same fuel use amount for the baseline and the reduced-emission locomotive/engine. However, the TCEQ may accept, at its discretion, fuel economy benefits of the new or repowered locomotive engine over the baseline unit when calculating emissions reductions. In general, fuel savings may occur as a result of idle reduction systems that come with the new or repowered locomotive and/or the enhanced fuel economy of the new engine.

To use this approach, the application must list the percentage reduction in fuel use expected through use of the reduced-emission locomotive when compared to the baseline. For replacement activities, the application should also list the historical average annual fuel use of the old locomotive (baseline) and an annual fuel use commitment for use of the new or repowered locomotive.

The TCEQ may consider a fuel economy benefit based on independent studies and test data. Documentation must be submitted with the application to justify the reduced fuel amount. The TCEQ will evaluate the documentation to determine the level of fuel savings that may be accepted.

Regardless of the baseline fuel use amount listed in the application, the TCEQ will apply a fuel economy factor to the fuel use commitment listed for the reduced-emission locomotive and engine. For instance, if the TCEQ agrees that the reduced-emission locomotive fuel use will be 30 percent less than the baseline locomotive fuel use for the same amount of work, then the baseline fuel use for the calculation will be determined by multiplying the fuel use commitment by a factor of 1.43 (1/.70 = 1.43). If the historical annual fuel use listed in the application is less than the number derived by applying the fuel economy factor, then that lower baseline number will be used.

The applicant should enter a realistic fuel use commitment for the expected work to be performed by the reduced-emission locomotive. If a grant is awarded, the grant recipient is obligated to use at least that amount of fuel annually in order to meet the grant usage requirements over the activity life.

The calculation of NO_X emissions reductions using annual fuel use is outlined in Table A4.1. Applicants should consult with the TCEQ for the appropriate

calculations for projects involving non-diesel engines.

Table A4.1
Calculating NO_X Emissions Reductions Based on Annual Fuel Use

Applying the TxLED Correction Factor

The counties affected by the TxLED requirements currently include all of the counties eligible for TERP incentive funding, as listed in Table 3.1, except for El Paso County.	
TxLED correction factor for non-road: *1 – 0.07*	0.93

Step 1. Determine the Reduced NO_X Emissions Factor

Option A. Reduced-emissions technology verified to achieve a percentage reduction from the baseline	
Baseline NO_X emissions factor (g/bhp-hr)	
× verified percentage reduction from baseline	
= reduced NO_X emissions factor (g/bhp-hr)	
Option B. Reduced-emissions engine certified to a specific emissions standard (g/bhp-hr)	
Certified NO_X emissions (g/bhp-hr)	

Step 2. Calculate the NO_X Emissions Reduction

Baseline		Reduced Emissions	
NO_X emissions factor (g/bhp-hr)		NO_X emissions factor (g/bhp-hr)	
× TxLED correction factor (*diesel engines only*)		× TxLED correction factor (*diesel engines only*)	
= corrected NO_X emissions factor (g/bhp-hr)		= corrected NO_X emissions factor (g/bhp-hr)	
× energy consumption factor (hp-hr/gal)		× energy consumption factor (hp-hr/gal)	
× annual fuel consumption (gal/yr)		× annual fuel consumption (gal/yr)	
= grams per year (g/yr)		= grams per year (g/yr)	
Baseline g/yr – reduced emissions g/yr =			
× percent within eligible counties (%)			
= grams per year reduced (g/yr)			
		÷ 907,200 grams per ton	
= estimated annual NO_X emissions reduction (tons/yr)			
× activity life (years)			
= estimated activity-life NO_X emissions reduction (tons)			

Calculating Cost-Effectiveness

Only the amount of incentive funds requested under the program can be used in cost-effectiveness calculations for locomotives. The incremental costs for each activity must be reduced by the value of any existing financial incentive that directly reduces the cost of the proposed activity, including tax credits or deductions, other grants, or any other public financial assistance.

To determine the cost-effectiveness of an activity, the incentive amount for the activity—with the exception of qualifying fuel activities—included in the project must be amortized over the activity life designated by the applicant, at a discount rate of 3 percent.

The following amortization formula yields a *capital-recovery factor* (CRF).

$$\text{capital-recovery factor} = \mathbf{[(1 + i)^n (i)] / [(1 + i)^n - 1]}$$

where i = discount rate (3 percent)
n = activity life

The discount rate of 3 percent reflects the opportunity cost of public funds—the level of earning that reasonably could be expected by investing state funds in various financial instruments, such as U.S. Treasury securities.

The incentive amount should be multiplied by the incremental cost or incentive amount requested to determine the annualized cost.

$$\textit{Incremental cost} \times \textit{CRF} = \textit{annualized cost}$$

The cost-effectiveness calculations are presented in Table A4.2. For use in the calculations, capital-recovery factors for up to 20 years are presented in Table A4.3.

Table A4.2
Calculating Cost-Effectiveness

Step 1. Determine the capital-recovery factor (CRF)	
$\text{CRF} = [(1 + i)^n (i)] / [(1 + i)^n - 1]$ i = discount rate (.03) n = activity life	
Capital-recovery factor:	
Step 2. Determine the annualized cost	
Incentive amount × CRF = annualized cost	
Annualized cost ($/year):	
Step 3. Determine cost-effectiveness	
Annualized cost ($/year) / annual NO_x emissions reduction (tons/year) = cost-effectiveness ($/ton)	
Cost-effectiveness ($/ton):	$

Table A4.3
Capital-Recovery Factors Using a Discount Rate of 0.03

Activity Life	1	2	3	4	5	6	7	8	9	10
CRF	1.00	.5226	.3535	.2690	.2184	.1846	.1605	.1425	.1284	.1172
Activity Life	11	12	13	14	15	16	17	18	19	20
CRF	.1081	.1005	.0940	.0885	.0838	.0796	.0760	.0727	.0698	.0672

For projects that include more than one activity, the total project incentive amount must be used to determine the cost-effectiveness of the project. The applicant may request an incentive amount that is less than the full incremental costs, in order to meet the cost-effectiveness criteria.

To determine the cost-effectiveness: First sum all of the annualized costs for the activities included in the project. Also sum the annual emissions reductions of each activity should also be added together to determine an annual emissions reduction for the project. Then divide the combined annualized costs for all activities included in the project application by the total annual NO_X emissions reductions for the combined project activities.

Total annualized costs / total annual NO_X reductions = project cost-effectiveness

Appendix 5
Stationary Equipment

The methods for calculating the NO_X emissions reductions for a stationary-engine project are included in this section. Most of the calculations will require input of a NO_X emissions factor applicable to the engine. The emissions standards and emissions factors applicable to this program are included in a technical supplement, which will be made available in conjunction with these guidelines at the TERP Web site, <www.terpgrants.org>. Examples of the calculations will also be available in the supplement, along with other materials prepared by the TCEQ. Potential grant applicants may also contact the TCEQ for hard copies of the supplement and for answers to questions about the applicable emissions standards and factors.

Eligible Activities and Costs

The eligible activities and costs under each project category are explained in this section. The TCEQ may further limit the types of eligible activities, and may more narrowly define eligibility requirements, under a particular funding round or by geographic area, as needed to best achieve the goals of the TERP. Administrative costs, in-house labor costs, and travel costs are not eligible expenses.

Purchase or Lease of Stationary Equipment

This category is for the purchase or lease of new stationary equipment. For this category, the TCEQ does not consider whether the applicant is replacing an existing piece of equipment, and the baseline for comparison of emissions is the current NO_X emissions standard for an engine of that horsepower. The baseline equipment used for determining the difference in cost must be a "new" piece of equipment.

To be eligible for funding, the engine on the new piece of equipment must be certified to emit at least 25 percent less NO_X than required (that is, no more than 75 percent of the NO_X allowable) under the current standard for an engine of that horsepower. "Certification" means approval by the EPA or the CARB, or acceptance on other grounds by the TCEQ.

A *lease* is defined as the use and control of a new piece of equipment in accordance with a lease contract for a period of five or more years. The TCEQ will reimburse the incremental costs of the lease—costs above those that would otherwise have been incurred for the lease of a baseline piece of stationary equipment.

The TCEQ will reimburse the incremental cost of the purchase of a new piece of equipment. The incremental cost is the difference between the documented dealer price of a baseline piece of equipment or other appropriate baseline cost established by the TCEQ and the actual cost of the cleaner equipment.

Replacement of Stationary Equipment

This category is for the replacement of stationary equipment with a new or newer piece of equipment. For this category, the applicant must be replacing a piece of equipment with a minimum of five years of remaining useful life. However, the TCEQ may establish longer activity-life requirements for each grant period. The baseline for comparison of emissions is the difference between the emissions of the equipment being replaced and those of the equipment being purchased.

For a replacement project, the TCEQ will evaluate whether the equipment being replaced would otherwise have been used in the eligible counties for the period within which the emissions reductions will be claimed. Standards that apply include **all** of the following:

1. The owner must have continuously owned the equipment for a minimum of two years immediately preceding the grant application date.
2. Unless otherwise approved by the TCEQ, the equipment must have been continuously located and used in Texas over the preceding two years.
3. The equipment must be in good operational condition and capable of performing its primary function.

The TCEQ may waive the two-year ownership requirement, case by case, where the ownership of the company has changed, the assets of the company have been purchased by another company, or the company has changed names or incorporation status. The use of the equipment being replaced must not have changed.

The TCEQ may require additional documentation to verify that the equipment would have been used within the eligible counties.

The engine on the replacement equipment must be certified to emit at least 25 percent less NO_X (that is, no more than 75 percent as much NO_X) compared with the engine being replaced. “Certification” means approval by the EPA or the CARB, or acceptance on other grounds by the TCEQ.

The replacement equipment must be of the same type and horsepower and should be intended for use in the same application or vocation (for example, well pump or generator) as the equipment being replaced. The TCEQ may accept, on a case-by-case basis, equipment of a different type to account for the latest technology used for a specific vocation.

The grant recipient may be eligible for reimbursement of up to 80 percent of the eligible costs for the purchase or lease of the replacement equipment, not to exceed an incentive amount that results in a cost-effectiveness of $15,000 or less per ton of NO_X reduced. The TCEQ may further limit the incentive amount to a cost-effectiveness lower than $15,000 per ton for particular funding periods, as needed to best achieve the goals of the TERP.

Costs may include the invoice price, including taxes and delivery charges included in the price of the replacement equipment, or the cash basis for the lease charges. Delivery charges from a third party, not included in the invoice price from the vehicle or equipment vendor, may be included, subject to approval by the TCEQ.

The total incentive amount must also not exceed 80 percent of the cost of the replacement equipment, minus the scrappage value received for the old equipment. The TCEQ may establish a default scrappage value.

Repower of Stationary Equipment

This category is for the replacement of an existing engine on a piece of stationary equipment with a new, rebuilt, or remanufactured engine.

The engine must be certified to emit at least 25 percent less NO_X (that is, no more than 75 percent as much NO_X) compared with the engine being replaced, based on the federal standard for that engine. “Certification” means approval by the EPA or the CARB, or acceptance on other grounds by the TCEQ.

Eligible rebuilt or remanufactured engines must use original-engine-manufacturer components only and be purchased from the OEM or its authorized dealers and distributors. However, the TCEQ may accept engines from suppliers not connected with the OEM, subject to a case-by-case determination.

The TCEQ will reimburse the incremental cost of the replacement engine—the cost to purchase and install the replacement engine and associated equipment, minus the scrappage value received for the old engine. The TCEQ may establish a default scrappage value.

Expenses for salaries, travel, and overhead, including indirect costs, are not covered. Costs that may be reimbursed, subject to approval by the TCEQ, include:

- the invoice cost of the new engine, including sales tax and delivery charges;
- the invoice cost of additional equipment that must be installed with the new engine;
- the cost of associated supplies directly related to the installation of the engine;
- costs to remove and dispose of the old engine;
- installation costs;
- reengineering costs, if the vehicle or equipment must be modified for the new engine to fit; and
- other costs directly related to the project.

Retrofit or Add-On of Emissions-Reduction Technology

This category is for the retrofit of an existing engine on a stationary piece of equipment, or for adding devices onto the equipment.

To be eligible for funding, the retrofit or add-on systems must be verified to emit at least 25 percent less NO_X (that is, no more than 75 percent as much NO_X) compared with the engine prior to the retrofit or add-on. "Verification" means approval by the EPA or the CARB, or acceptance on other grounds by the TCEQ.

The TCEQ will reimburse the incremental cost of the purchase and installation of the retrofit or add-on technology. If the engine is to be rebuilt to install the emissions- reduction devices, the incremental cost is the difference between the cost of rebuilding the existing engine and the cost of rebuilding the engine to include the retrofit or add-on technology. If the engine does not need to be rebuilt in conjunction with installing the new technology, then the incremental cost will be the full cost of purchasing and installing the technology.

Expenses for salaries, travel, and overhead, including indirect costs, will not be covered. Costs that may be reimbursed, subject to approval by the TCEQ, include:

- the invoice cost of the retrofit kit or add-on devices, including sales tax and delivery charges;
- the cost of associated supplies directly related to the installation of the devices;
- installation costs;
- reengineering costs, if the vehicle or equipment must be modified for the retrofit or add-on devices to be installed and used; and
- other costs directly related to the project.

Project Criteria

In addition to the eligibility criteria previously presented, the following list of criteria applies to projects involving stationary engines. The TCEQ may impose additional criteria, and may more narrowly define the criteria established in this guide, under a particular funding period, as needed to best achieve the goals of the TERP.

- One or more eligible **activities** of the same project type (i.e., on-road, non-road, locomotive, etc.) and that will occur in the same primary area may be included under one project application.
- The applicant must own the equipment being replaced, repowered, or retrofitted.
- Stationary equipment used primarily for competition or recreation, or used primarily to support those types of activities, is not eligible for funding.
- Stationary-equipment activities must provide at least a 25 percent NO_X emissions reduction compared to baseline NO_X emissions. The NO_X emissions of equipment, engines, and retrofit or add-on devices used to achieve the emissions reductions must be certified or verified by the EPA, the CARB, or otherwise accepted by the TCEQ. Where the model year of the equipment and the model year of the existing engine are different—such as equipment that has already had the engine replaced with a newer engine—the model year of the engine must be used to determine the baseline emissions standard for emissions-reduction calculations. The application of the 25 percent reduction criterion for each type of activity is explained as follows.

  Purchases and leases are allowed based on what year the purchase or lease is completed. At a minimum, the equipment and engine being purchased or leased must be certified to emit at least 25 percent less NO_X (that is, no more than 75 percent as much NO_X) compared with the current standard for that engine.

  Replacements. The replacement equipment and engine must have been certified to emit at least 25 percent less NO_X than the standard for the engine installed on the equipment being replaced.

  Repowers. The replacement engine must be certified to emit at least 25 percent less NO_x than the engine being replaced, based on the standard for that engine.

  Retrofits and add-ons. Emissions standards for retrofit and add-on activities are based on the engine being retrofitted. If an applicant wants to retrofit or add on a device, the technology must be verified to emit at least 25 percent less NO_X than the standard for the engine being retrofitted.

  Combined technologies. Where two technologies (for example, repower plus retrofit) are combined on the same equipment, engine, or both, the

TCEQ may consider the combined reductions from the two technologies in meeting the 25 percent requirement. This decision will be solely at the discretion of the TCEQ, and will be based on a determination that the combination of the two technologies will permanently reduce emissions by at least 25 percent.

- In the areas of the state where Texas Low Emission Diesel (TxLED) is required, the baseline and reduced-emissions-rate calculations for diesel-engine use after September 2005 must be adjusted using a correction factor, in addition to any other calculation adjustments.

Figure A5.1
Correction Factor for TxLED

The TCEQ adopted rules (30 TAC 114.312–319) requiring that diesel fuel sold or supplied for use in compression-ignition engines in certain counties in Texas must meet low-emission-diesel standards.

The counties affected by the TxLED requirements currently include all of the counties eligible for TERP incentive funding, as listed in Table 3.1, except for El Paso County.

The requirements set a maximum for content of aromatic hydrocarbons of 10 percent by volume. The requirements also set a minimum cetane number for TxLED of 48.

The TxLED requirements are intended to result in reductions in NO_X emissions from diesel engines. Currently, reduction factors of **5.7 percent** (0.057) for on-road use and **7.0 percent** (0.07) for non-road use have been accepted as estimates for use of TxLED. However, this reduction estimate is subject to change, based on the standards accepted by the EPA for use in the Texas State Implementation Plan. The TCEQ will identify the appropriate reduction factor to use in the technical supplement prepared to support these guidelines.

For activities in the applicable counties, a correction factor will need to be applied when calculating the baseline or reduced emissions for diesel engines.

On-road:
TxLED correction factor = 1 – 0.057 = ***0.943***

Non-road:
TxLED correction factor = 1 – 0.070 = ***0.93***

- The cost-effectiveness of a project, other than a demonstration project, must not exceed $15,000 per ton of NO_X emissions reduced in the eligible counties for which the project is proposed. Individual activities included under a single project application may exceed this amount, but the combined project must meet the cost-effectiveness standard.
- Infrastructure activities—including infrastructure costs that are part of a broader repower, retrofit, replacement, or add-on project—are excluded from the cost-effectiveness limit of $15,000 per ton.
- An activity is not eligible if it is required by any state or federal law, rule, regulation, memorandum of agreement, or other legally binding document. However, this restriction does not apply to an otherwise qualified

- Activities for the repower or retrofit of an existing engine that must meet a more stringent emissions standard under state or federal regulations at the time of engine replacement, overhaul, or remanufacture may also be eligible if the requirement does not include a deadline or specific time period for the upgrade to occur. The more stringent emissions standard will be used as the baseline emissions rate in the calculation to determine the emissions reductions and the determination that the activity will result in at least a 25 percent reduction in NO_X.
- An activity involving a new emissions-reduction measure that would otherwise generate marketable credits under state or federal emissions reduction credit averaging, banking, or trading programs is not eligible for funding under this program unless:
  - the activity includes the transfer of the reductions that would otherwise be marketable credits to the State Implementation Plan or the owner or operator as provided under Texas Health and Safety Code 386.056; and
  - the reductions are permanently retired.
- The incremental cost of the proposed activity must be reduced by the value of any existing financial incentive that directly reduces the cost of the proposed activity, including tax credits or deductions, other grants, or any other public financial assistance.

  For repower activities, eligible rebuilt or remanufactured engines must use original-engine-manufacturer components only and be purchased from the OEM or its authorized dealers and distributors. However, the TCEQ may accept engines from suppliers not connected with the OEM, subject to a case-by-case determination.

- For all activities, the activity life must be a minimum of five years. The TCEQ may establish longer activity life requirements for each grant period. Not less than 75 percent of the annual use of the equipment must take place in one or more of the eligible counties throughout the life of the project. Leases must be for the length of the activity life. Annual use will be measured by either hours of operation or fuel consumption.

- For most equipment, annual use normally will be measured using hours of operation. For equipment without an hour meter installed, and no viable mechanism for measuring the hours of operation, fuel consumption normally should be used as the usage factor.
- Applicants should refer to the technical supplement to these guidelines for the maximum acceptable activity life established by the TCEQ for each type of activity.
- Applicants must agree to monitor the use of grant-funded vehicles, equipment, infrastructure, and fuel, and to report to the TCEQ for the life of each grant-funded activity.
- Applicants must also agree to notify the TCEQ of any changes in the following during the activity life: termination of use; change in use, sale, transfer, or accidental or intentional destruction of grant-funded vehicles or equipment; or change in use of the qualifying fuel.
- Administrative costs and other internal costs of the grant recipient, including but not limited to personnel expenses, internal salaries, indirect costs, and travel are not eligible. This restriction also applies to situations where the grant recipient acts as a transporter for delivery of the grant-funded vehicle or equipment before or after accepting it.
- Consultant fees for the preparation of a grant application, either directly or as an addition of the cost basis of the grant-funded vehicle, equipment, or engine, are not eligible for reimbursement by the TCEQ.
- Fees for a third-party consultant hired by the grant recipient to manage and administer the grant-funded activities, including coordination of the work and submission of reports and paperwork to the TCEQ for the grant recipient, are not eligible. This restriction is not intended to limit the ability of the vehicle or equipment supplier or installer to include reasonable and necessary costs for managing the work to be performed in the price of the vehicle, equipment, or installation services. The costs for professional services, including engineering and technical work, required for completion of the activity may be included, subject to the restrictions pertaining to that type of project. Per the Uniform Grant Management Standards, the cost plus a percentage of cost methods of contracting for professional services shall not be used.
- The TCEQ may impose additional criteria for certain projects and funding periods, consistent with these guidelines.

NO_x Emissions Standards

The baseline NO_X emissions standards for this program normally should be the federal standards for NO_X emissions applicable to the type of engine involved. For most agricultural irrigation-pump activities, the standards applicable to non-road engines will apply. The federal NO_X emissions standards for non-road

diesel engines are listed in the technical supplement available from the TCEQ. For gas turbine engines and alternative fuel engines the emission standards and applicable baseline factors may not be listed in the technical supplement and may need to be determined on a case-by-case basis. Potential grant applicants should consult with the TCEQ to ensure they use the appropriate baseline standards.

Calculating NO_x Emissions Reductions

In general, the emissions-reduction benefit represents the difference in the emissions level of a baseline engine and a reduced-emissions engine. In situations where the model year of the equipment and the model year of the current engine are different, the model year of the engine must be used to determine the baseline emissions for benefit calculations.

The emissions level is calculated by multiplying an emissions factor, an activity level, and a conversion factor, if necessary. Because conversion factors and activity levels may be expressed in different units for the existing and replacement engines, the emissions levels for the baseline and reduced-emissions engines should be calculated separately, and then differences taken to determine emissions reductions.

For most stationary engine applications, the activity level should be established by the annual hours of operation. For equipment without an hour meter installed, and no other mechanism to track hours of operation, the activity level should be determined based on annual fuel consumption. Emissions-reduction calculations should be consistent with the type of records maintained over the life of each activity.

Calculation of NO_x Emissions Reductions Based on Annual Hours of Operation

The calculation of emissions and emissions reductions using annual hours of operation as the usage factor is determined by the steps shown in Table A5.1.

Table A5.1
Calculating NO_X Emissions Reductions Based on Annual Hours of Operation

Applying the TxLED Correction Factor

The counties affected by the TxLED requirements currently include all of the counties eligible for TERP incentive funding, as listed in Table 3.1, except for El Paso County.	
TxLED correction factor for non-road: *1 – 0.07*	0.93

Step 1. Determine the Reduced NO_X Emissions Factor

Option A. Reduced-emissions technology verified to achieve a percentage reduction from the baseline	
Baseline NO_X emissions factor (g/bhp-hr)	
× verified percentage reduction from baseline	
= reduced NO_X emissions factor (g/bhp-hr)	
Option B. Reduced-emissions engine certified to a specific emissions standard (g/bhp-hr)	
Certified NO_X emissions (g/bhp-hr)	

Step 2. Calculate the NO_X Emissions Reduction

Baseline		Reduced Emissions	
NO_X emissions factor (g/bhp-hr)		NO_X emissions factor (g/bhp-hr)	
× TxLED correction factor (*diesel engines only*)		× TxLED correction factor (*diesel engines only*)	
= corrected NO_X emissions factor (g/bhp-hr)		= corrected NO_X emissions factor (g/bhp-hr)	
× load factor		× load factor	
× horsepower		× horsepower	
= grams per hour (g/hr)		= grams per hour (g/hr)	
Baseline g/hr – reduced emissions g/hr =			
× annual hours of operation			
× percent within eligible counties (%)			
= grams per year reduced (g/year)			
		÷ 907,200 grams per ton	
= estimated annual NO_X emissions reduction (tons/yr)			
× activity life (years)			
= estimated activity-life NO_X emissions reduction (tons)			

For diesel engines, appropriate baseline NO_X emissions factors and default load factors are included in the technical supplement to these guidelines. Potential applicants may need to contact the TCEQ for appropriate factors to use for gas turbine engines and alternative fuel engines. Use the emissions factors associated with engine horsepower and model year. Use the load factor associated with the type of equipment. In general, grams per kilowatt-hour should be converted to grams per brake horsepower-hour for the calculations. Potential grant applicants should consult with the TCEQ to ensure they use the appropriate factors.

For retrofit and add-on activities, and other activities where the emissions reductions are based on a percentage reduction from the baseline, the verified percentage reduction factor can be applied to the baseline emissions factor to determine the reduced NO_X emissions factor.

Alternatively, for activities where the emissions of the new or replacement engine are certified at a specific emissions level (in g/bhp-hr), such as purchases or repowers, use that emissions level as the emissions factor.

Calculation of NO_X Emissions Reductions Based on Annual Fuel Use

If the annual fuel consumption is used, the activity level should be based on actual annual fuel receipts or other available documentation to estimate the expected annual fuel use of the equipment. An energy consumption factor must also be calculated. The energy consumption factor converts the emissions factor in g/bhp-hr to g/gal of fuel used. There are two ways of calculating the energy consumption factor:

1. by dividing the hp of the engine by the fuel economy in gal/hr; or
2. by dividing the density of the fuel by the brake-specific fuel consumption of the baseline engine.

Check with your equipment dealer to confirm the fuel economy or fuel consumption of the equipment for the type of application.

Default fuel-consumption-rate factors may be included in the technical supplement to these guidelines.

The calculation of NO_X emissions reductions based on annual fuel use is outlined in Table A5.2. Applicants should consult with the TCEQ for the appropriate calculations for projects involving non-diesel engines.

Table A5.2
Calculating NO_X Emissions Reductions Based on Annual Fuel Use

Applying the TxLED Correction Factor

The counties affected by the TxLED requirements currently include all of the counties eligible for TERP incentive funding, as listed in Table 3.1, except for El Paso County.	
TxLED correction factor for non-road: *1 – 0.07*	0.93

Step 1. Determine the Reduced NO_x Emissions Factor

Option A. Reduced-emissions technology verified to achieve a percentage reduction from the baseline	
Baseline NO_X emissions factor (g/bhp-hr)	
× verified percentage reduction from baseline	
= reduced NO_X emissions factor (g/bhp-hr)	
Option B. Reduced-emissions engine certified to a specific emissions standard (g/bhp-hr)	
Certified NO_X emissions (g/bhp-hr)	

Step 2. Calculate the NO_X Emissions Reduction

Baseline		Reduced Emissions	
NO_X emissions factor (g/bhp-hr)		NO_X emissions factor (g/bhp-hr)	
× TxLED correction factor *(diesel engines only)*		× TxLED correction factor *(diesel engines only)*	
= corrected NO_X emissions factor (g/bhp-hr)		= corrected NO_X emissions factor (g/bhp-hr)	
× energy consumption factor (hp-hr/gal)		× energy consumption factor (hp-hr/gal)	
× annual fuel consumption (gal/yr)		× annual fuel consumption (gal/yr)	
= grams per year (g/yr)		= grams per year (g/yr)	
Baseline g/yr – reduced emissions g/yr =			
× percent within eligible counties (%)			
= grams per year reduced (g/yr)			
		÷ 907,200 grams per ton	
= estimated annual NO_X emissions reduction (tons/yr)			
× activity life (years)			
= estimated activity-life NO_X emissions reduction (tons)			

Calculating Cost-Effectiveness

Only the amount of incentive funds requested under the program will be used in cost-effectiveness calculations. The incremental costs for each activity must be reduced by the value of any existing financial incentive that directly reduces the cost of the proposed activity, including tax credits or deductions, other grants, or any other public financial assistance.

To determine the cost-effectiveness of an activity—with the exception of qualifying fuel activities—the incentive amount for the activity included in the project must be amortized over the activity life designated by the applicant, at a discount rate of 3 percent.

The following amortization formula yields a *capital-recovery factor* (CRF).

$$\text{capital-recovery factor} = \mathbf{[(1 + i)^n (i)] / [(1 + i)^n - 1]}$$

where i = discount rate (3 percent)
n = activity life

The discount rate of 3 percent reflects the opportunity cost of public funds—the level of earning that reasonably could be expected by investing state funds in various financial instruments, such as U.S. Treasury securities.

The incentive amount should be multiplied by the incremental cost or incentive amount requested to determine the annualized cost.

$$\textit{Incremental cost} \times \textit{CRF} = \textit{annualized cost}$$

The cost-effectiveness calculations are presented in Table A5.3. Capital-recovery factors for up to 20 years are presented in Table A5.4, for use in the calculations.

Table A5.3
Calculating Cost-Effectiveness

Step 1. Determine the capital-recovery factor (CRF)	
$CRF = [(1 + i)^n (i)] / [(1 + i)^n - 1]$ i = discount rate (.03) n = activity life	
Capital-recovery factor:	
Step 2. Determine the annualized cost	
Incentive amount × CRF = annualized cost	
Annualized cost ($/year):	
Step 3. Determine cost-effectiveness	
Annualized cost ($/year) / annual NO_X emissions reduction (tons/year) = cost-effectiveness ($/ton)	
Cost-effectiveness ($/ton):	$

Table A5.4
Capital-Recovery Factors Using a Discount Rate of 0.03

Activity Life	1	2	3	4	5	6	7	8	9	10
CRF	1.00	.5226	.3535	.2690	.2184	.1846	.1605	.1425	.1284	.1172
Activity Life	11	12	13	14	15	16	17	18	19	20
CRF	.1081	.1005	.0940	.0885	.0838	.0796	.0760	.0727	.0698	.0672

For projects that include more than one activity, the total project incentive amount is to be used to determine the cost-effectiveness of the project. The applicant may request an incentive amount that is less than the full incremental costs, in order to meet the cost-effectiveness criteria.

To determine the cost-effectiveness: First sum all of the annualized costs for the activities included in the project. Also sum the annual emissions reductions of each activity should also be added together to determine an annual emissions reduction for the project. Then divide the combined annualized costs for all activities included in the project application by the total annual NO_X emissions reductions for the combined project activities.

Total annualized costs / total annual NO_X reductions = project cost-effectiveness

Appendix 6
Refueling Infrastructure

This section contains the project criteria for refueling infrastructure that provides qualifying fuel. The emissions reductions should be estimated using applicant-supplied information on the type of vehicles and equipment using the fuel. The emissions reduction for the activity will be the difference in the emissions level in tons of NO_X expected to be produced by baseline vehicles and equipment, and the emissions level in tons of NO_X expected to be produced through the use of the qualifying fuel by the vehicles and equipment, within the eligible counties.

The emissions standards and emissions factors applicable to this program are contained in a technical supplement, which will be made available in conjunction with these guidelines. Potential grant applicants should contact the TCEQ for copies of the supplement and for answers to questions about which emissions standards and factors to use.

Eligible Activities and Costs

The TCEQ may further limit the types of eligible activities beyond policies stated here, and may more narrowly define eligibility requirements, under a particular funding round or by geographic area, as needed to best achieve the objectives of the TERP.

The grant recipient may be eligible for reimbursement up to 50 percent of the total eligible costs for the purchase and installation of the infrastructure. However, expenses for salaries, travel, land purchases, and overhead, including indirect costs, will not be covered. Costs that may be reimbursed by the TCEQ include:

- the invoice cost of the infrastructure equipment, including sales tax and delivery charges;
- the cost of associated supplies directly related to the installation of the infrastructure;
- installation costs;
- costs of design and engineering work directly necessary for the installation of the infrastructure; and
- reengineering and construction costs, if the existing site must be modified to allow for installation of the infrastructure.

All grant-funded infrastructure is required to be purchased, not leased.

Project Criteria

In addition to the eligibility criteria previously presented, the following list of criteria applies to projects involving non-road equipment activities. The TCEQ may impose additional criteria, and may more narrowly define the criteria established in the guide, during a particular funding period or by geographic area, as needed to best achieve the objectives of the TERP.

- One or more eligible **activities** of the same project type (i.e., on-road, non-road, locomotive, etc.) that will occur in the same primary area may be included under one project application.
- Infrastructure for fueling vehicles and equipment used primarily for competition or recreation is not eligible for funding.
- The infrastructure project must result in new, surplus emissions reductions that will then be available to the TCEQ for use in the State Implementation Plan. In general, the TCEQ will not accept as a new emissions reduction the conversion of a vehicle or equipment fleet that occurred earlier than 12 months before the grant application deadline.
- An activity is not eligible if it is required by any state or federal law, rule, regulation, memorandum of agreement, or other legally binding document. However, this restriction does not apply to an otherwise qualified activity—regardless of the State Implementation Plan's assumption that the change in equipment, vehicles, or operations will occur—if, on the date the grant is awarded, the change is not yet required by any state or federal law, rule, regulation, memorandum of agreement, or other legally binding document. This restriction also does not apply to the purchase of vehicles or equipment that is required only by local law or regulation, or by corporate or controlling board policy of a public or private entity. Demonstration projects used to demonstrate a technology that may be used to comply with an emissions-reduction requirement may be funded, as long as the reductions directly attributable to the demonstration project are not used to comply with those requirements.
- An activity involving a new emissions-reduction measure that would otherwise generate marketable credits under state or federal emissions reduction credit averaging, banking, or trading programs is not eligible for funding under this program unless:
    - the activity includes the transfer of the reductions that would otherwise be marketable credits to the State Implementation Plan or the owner or operator as provided under Texas Health and Safety Code 386.056; and
    - the reductions are permanently retired.

- The incremental cost of the proposed activity must be reduced by the value of any existing financial incentive that directly reduces the cost of the proposed activity, including tax credits or deductions, other grants, or any other public financial assistance.
- In the areas of the state where Texas Low Emission Diesel (TxLED) is required, the baseline and reduced-emissions-rate calculations for diesel-engine use after September 2005 must be adjusted using a correction factor, in addition to any other calculation adjustments.

Figure 6.1
Correction Factor for TxLED

The TCEQ adopted rules (30 TAC 114.312–319) requiring that diesel fuel sold or supplied for use in compression-ignition engines in certain counties in Texas must meet low-emission-diesel standards.

The counties affected by the TxLED requirements currently include all of the counties eligible for TERP incentive funding, as listed in Table 3.1, except for El Paso County.

The requirements set a maximum for content of aromatic hydrocarbons of 10 percent by volume. The requirements also set a minimum cetane number for TxLED of 48.

The TxLED requirements are intended to result in reductions in NO_x emissions from diesel engines. Currently, reduction factors of **5.7 percent** (0.057) for on-road use and **7.0 percent** (0.07) for non-road use have been accepted as estimates for use of TxLED. However, this reduction estimate is subject to change, based on the standards accepted by the EPA for use in the Texas State Implementation Plan. The TCEQ will identify the appropriate reduction factor to use in the technical supplement prepared to support these guidelines.

For activities in the applicable counties, a correction factor will need to be applied when calculating the baseline or reduced emissions for diesel engines.

On-road:
TxLED correction factor = 1 – 0.057 = ***0.943***

Non-road:
TxLED correction factor = 1 – 0.070 = ***0.93***

- Infrastructure activities—including infrastructure costs that are part of a broader repower, retrofit, replacement, or add-on project—are excluded from the statutory cost-effectiveness limit of $15,000 per ton. However, the TCEQ may limit the cost-effectiveness for each grant round.
- For all activities, the activity life must be a minimum of five years. The TCEQ may establish longer activity life requirements for each grant period. Not less than 75 percent of the annual usage of the qualifying fuel dispensed from the infrastructure must take place in one or more of the eligible counties throughout the life of the project. For infrastructure activities to provide fuel for marine vessels, not less than 75 percent of the annual usage of the qualifying fuel dispensed from the infrastructure must take place in bays

adjacent to one or more of the eligible counties, or in the Texas portion of the Gulf Intracoastal Waterway throughout the life of the project.

- Annual usage normally should be measured using fuel consumption by the vehicles or equipment being provided the fuel from the infrastructure. Therefore, a grant recipient must have a viable mechanism for tracking and reporting on the use of the fuel dispensed from the infrastructure.
- The TCEQ will determine an acceptable activity life for infrastructure activities, case by case.
- Applicants must agree to monitor the use of grant-funded vehicles, equipment, infrastructure, and fuel, and to report to the TCEQ for the life of each grant-funded activity. If the grant recipient does not own or operate the vehicles or equipment to be provided fuel from the infrastructure, the recipient will need to explain, as a condition of the grant, what mechanism will be used to ensure that the vehicles and equipment are operated within the eligible counties for the specified time period.
- Applicants must also agree to notify the TCEQ of any changes in the following during the activity life: termination of use; change in use, sale, transfer, or accidental or intentional destruction of grant-funded vehicles, equipment, or infrastructure; or change in use of the qualifying fuel.
- Administrative costs and other internal costs of the grant recipient, including but not limited to personnel expenses, internal salaries, indirect costs, and travel are not eligible. This restriction also applies to situations where the grant recipient acts as a transportation provider for delivery of the grant-funded vehicle or equipment before or after accepting it.
- Consultant fees for the preparation of a grant application, either directly or as an addition of the cost basis of the grant-funded vehicle, equipment, or engine, are not eligible for reimbursement by the TCEQ.
- Fees for a third-party consultant hired by the grant recipient to manage and administer the grant-funded activities, including coordination of the work and submission of reports and paperwork to the TCEQ for the grant recipient, are not eligible. This restriction is not intended to limit the ability of the vehicle or equipment supplier or installer to include reasonable and necessary costs for managing the work to be performed in the price of the vehicle, equipment, or installation services. The costs for professional services, including engineering and technical work, required for completion of the activity may be included, subject to the restrictions pertaining to that type of project. Per the Uniform Grant Management Standards, the cost plus a percentage of cost methods of contracting for professional services shall not be used.
- The TCEQ may impose additional criteria for certain projects and funding periods, consistent with these guidelines.

NO_X Emissions Standards

The baseline NO_X emissions standards for this program normally should be the federal standards for NO_X emissions applicable to the engines being provided the fuel from the infrastructure. The federal NO_X emissions standards for various categories of engines are listed in the technical supplement available from the TCEQ. Potential grant applicants should consult with the TCEQ to ensure they use the appropriate baseline standards.

Calculating NO_X Emissions Reductions

In general, the emissions-reduction benefit represents the difference in the emissions level of a baseline engine and a reduced-emissions engine. For refueling-infrastructure activities, NO_X emissions reductions should be calculated based on information regarding the type of vehicles and equipment using the fuel.

NO_X emissions reductions may be claimed for a verified fuel or fuel additive, the purchase and use of alternative-fueled vehicles or equipment, or an upgrade or conversion of vehicles or equipment. The TCEQ may limit the types of eligible activities during a particular grant period.

Emissions reductions for the use of a fuel or fuel additive must be verified by the EPA or CARB, or otherwise accepted by the TCEQ, as achieving the claimed reductions when used in lieu of a baseline fuel or an additive mixed with a baseline fuel. The verified fuel or additive may only be used in vehicles and equipment owned or operated by the applicant.

In some cases, the TCEQ may accept a claim of NO_X emissions reductions based on the purchase and use of alternative-fueled vehicles or equipment that are certified at an NO_X emissions rate that is less than the federal standard for that engine. In general, the vehicles and equipment using the qualifying fuel should be owned or operated by the applicant. However, the TCEQ will consider situations where the fuel will be supplied to upgraded fleets owned or operated by another entity. The TCEQ will require a letter of agreement with a third party indicating a willingness to use the qualifying fuel and report on its use.

For vehicle or fleet upgrades or conversions, a reduction in NO_X emissions must occur when compared to an equivalent baseline engine. The upgraded vehicle or equipment engines must be certified to a NO_X-emissions rate that is less than the standard for that type of engine under the test cycle used. The NO_X emissions reductions are based on the difference in the emissions rates. In general, the baseline for comparison for natural gas vehicles certified under the diesel cycle will be the diesel-engine standard applicable to that type of engine. Similarly, for propane-, natural gas–, and other-fueled vehicles and equipment certified under

the Otto-cycle standard, the baseline for comparison will be the federal Otto-cycle standard applicable to that type of engine.

The TCEQ may also consider, at its discretion, the use of NO_X emissions reductions achieved through the replacement of conventionally powered vehicles or equipment with new or newer vehicles powered by alternative fuels to be serviced by the refueling infrastructure. The emissions reductions under this approach will be based on the same methodology and requirements as apply to a replacement project involving the same type of vehicle or equipment. If the grant recipient does not own the vehicles or equipment being replaced, the recipient will be responsible for securing necessary agreements from the vehicle or equipment owner to destroy the vehicle or equipment being replaced and to use the replacement vehicle or equipment in the eligible counties for the percentage of annual usage and for the annual and total usage amounts required for the activity life.

Calculating Cost-Effectiveness

Only the amount of incentive funds requested under the program will be used in cost-effectiveness calculations. The incremental costs for each activity must be reduced by the value of any existing financial incentive that directly reduces the cost of the proposed activity, including tax credits or deductions, other grants, or any other public financial assistance.

To determine the cost-effectiveness of an activity—with the exception of qualifying fuel activities—the incentive amount for the activity included in the project must be amortized over the activity life designated by the applicant, at a discount rate of 3 percent.

The following amortization formula yields a *capital-recovery factor* (CRF).

$$\text{capital-recovery factor} = \mathbf{[(1 + \mathit{i})^n (\mathit{i})] / [(1 + \mathit{i})^n - 1]}$$

where i = discount rate (3 percent)
n = activity life

The discount rate of 3 percent reflects the opportunity cost of public funds—the level of earning that reasonably could be expected by investing state funds in various financial instruments, such as U.S. Treasury securities.

The incentive amount must be multiplied by the incremental cost or incentive amount requested to determine the annualized cost.

$$\textit{Incremental cost} \times \textit{CRF} = \textit{annualized cost}$$

The cost-effectiveness calculations are presented in Table A6.1. Capital-recovery factors for up to 20 years are presented in Table A6.2, for use in the calculations.

Table A6.1
Calculating Cost-Effectiveness

Step 1. Determine the capital-recovery factor (CRF)	
$CRF = [(1 + i)^n (i)] / [(1 + i)^n - 1]$ i = discount rate (.03) n = activity life	
Capital-recovery factor:	
Step 2. Determine the annualized cost	
Incentive amount × CRF = annualized cost	
Annualized cost ($/year):	
Step 3. Determine cost-effectiveness	
Annualized cost ($/year) / annual NO_X emissions reduction (tons/year) = cost-effectiveness ($/ton)	
Cost-effectiveness ($/ton):	$

Table A6.2
Capital-Recovery Factors Using a Discount Rate of 0.03

Activity Life	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
CRF	1.00	.5226	.3535	.2690	.2184	.1846	.1605	.1425	.1284	.1172
Activity Life	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
CRF	.1081	.1005	.0940	.0885	.0838	.0796	.0760	.0727	.0698	.0672

For projects that include more than one activity, the total project incentive amount will be used to determine the cost-effectiveness of the project. The applicant may request an incentive amount that is less than the full incremental costs, in order to meet the cost-effectiveness criteria.

To determine the cost-effectiveness: First sum all of the annualized costs for the activities included in the project. Also sum the annual emissions reductions of each activity should also be added together to determine an annual emissions reduction for the project. Then divide the combined annualized costs for all activities included in the project application by the total annual NO_X emissions reductions for the combined project activities.

Total annualized costs / total annual NO_X reductions = project cost-effectiveness

Appendix 7
On-Site Electrification and Idle-Reduction Infrastructure

This section contains the project criteria for on-site electrification and idle-reduction infrastructure. The emissions reductions should be estimated using applicant-supplied information on the type of vehicles and equipment being supplied the electricity or serviced by the idle-reduction infrastructure. The emissions reduction for the activity will be the difference in the emissions level in tons of NO_X expected to be produced by baseline vehicles and equipment, and the emissions level in tons of NO_X expected to be produced through the electrification or reduction in idling of the vehicles and equipment, within the eligible counties.

The emissions standards and emissions factors applicable to this program are provided in a technical supplement, which will be made available in conjunction with these guidelines. Potential grant applicants should contact the TCEQ for copies of the supplement and for answers to questions about which emissions standards and factors to use.

Eligible Activities and Costs

An eligible activity may include the purchase and installation of on-site infrastructure—including auxiliary power units—designed to dispense electricity to motor vehicles, on-road heavy-duty vehicles, non-road equipment, stationary equipment, locomotives, or marine vessels. The electricity may replace the power normally supplied by the engine while the vehicle or equipment is parked (idle reduction), or recharge electric vehicles or equipment being used in lieu of vehicles or equipment powered by an internal combustion engine. The applicant will need to show that the infrastructure is needed and will be used in an eligible county.

Subject to approval of the TCEQ, the on-site infrastructure may also include other services, in addition to providing electricity, as part of an idle-reduction program. These other services may include air conditioning and heating, phone and cable TV access, and other hospitality services directly related to reducing vehicle idling.

In some cases, the TCEQ may also accept applications for infrastructure related to electrification of stationary equipment, in lieu of equipment powered by an internal combustion engine.

State agencies may apply for grants to fund the lease, purchase, or installation of idle-reduction technologies and facilities at rest areas and other public facilities on major highway transportation routes in eligible areas, and on eligible water routes. The TCEQ may approve operating costs for initial setup, and to ensure proper operation of the infrastructure at these facilities. Idle-reduction facilities are encouraged at the state's ports and border crossings.

Note that, in some areas of the state, idling operation of on-road vehicles may be limited by state regulations. Accordingly, the project emissions reductions used to determine the cost-effectiveness for infrastructure activities in an area with such a requirement may not include the replacement of idling hours of operation for on-road vehicles. Non-road equipment and other eligible uses of the electricity by on-road vehicles are not covered by this restriction.

The TCEQ may further limit the types of eligible activities, and may more narrowly define eligibility requirements, during a particular funding period or by geographic area, as needed to best achieve the objectives of the TERP.

Projects Other than Idle-Reduction Infrastructure Installed by Other State Agencies

For such projects, the grant recipient may be eligible for reimbursement up to 50 percent of the total eligible costs for the purchase and installation of the infrastructure. However, expenses for salaries, travel, land purchases, and overhead, including indirect costs, will not be covered. Costs that may be reimbursed by the TCEQ, subject to its approval, include:

- the invoice cost of the infrastructure equipment, including sales tax and delivery charges;
- the cost of associated supplies directly related to the installation of the infrastructure;
- installation costs;
- the costs of design and engineering work directly necessary for the installation of the infrastructure;
- reengineering and construction costs, if the existing site must be modified to allow for installation of the infrastructure; and
- other costs directly related to the project.

All grant-funded idle-reduction equipment and infrastructure must be purchased and not leased.

Idle-Reduction Infrastructure Installed by Other State Agencies at Rest Stops and Other Public Facilities

Up to the full cost of idle-reduction infrastructure installed at rest stops and other public facilities by another state agency may be eligible for funding under the grant. In addition, the cost of leasing or contracting for the infrastructure installation and start-up operation of the infrastructure may be included in the grant, subject to limitations on the length of time the funds are available under the grant contract.

Project Criteria

In addition to the eligibility criteria previously presented, the following list of criteria applies to projects involving electrification infrastructure. The TCEQ may impose additional criteria, and may more narrowly define the criteria established in this guide, during a particular funding period or by geographic area, as needed to best achieve the objectives of the TERP.

- One or more eligible **activities** of the same project type (i.e., on-road, non-road, locomotive, etc.) that will occur in the same primary area may be included under one project application.
- Infrastructure used to service vehicles and equipment used primarily for competition or recreation is not eligible for funding.
- The infrastructure project must result in new, surplus emissions reductions that will then be available to the TCEQ for assignment to the State Implementation Plan. In general, the TCEQ will not accept as a new emissions reduction the conversion of a vehicle or equipment fleet that occurred earlier than 12 months prior to the grant application deadline.
- In the areas of the state where Texas Low Emission Diesel (TxLED) is required, the baseline and reduced emissions rate calculations for diesel engine usage after September 2005 must be adjusted using a correction factor, in addition to any other calculation adjustments.

Figure A7.1
Correction Factor for TxLED

The TCEQ adopted rules (30 TAC 114.312–319) requiring that diesel fuel sold or supplied for use in compression-ignition engines in certain counties in Texas must meet low-emission-diesel standards.

The counties affected by the TxLED requirements currently include all of the counties eligible for TERP incentive funding, as listed in Table 3.1, except for El Paso County.

The requirements set a maximum for content of aromatic hydrocarbons of 10 percent by volume. The requirements also set a minimum cetane number for TxLED of 48.

The TxLED requirements are intended to result in reductions in NO_x emissions from diesel engines. Currently, reduction factors of **5.7 percent** (0.057) for on-road use and **7.0 percent** (0.07) for non-road use have been accepted as estimates for use of TxLED. However, this reduction estimate is subject to change, based on the standards accepted by the EPA for use in the Texas State Implementation Plan. The TCEQ will identify the appropriate reduction factor to use in the technical supplement prepared to support these guidelines.

For activities in the applicable counties, a correction factor will need to be applied when calculating the baseline or reduced emissions for diesel engines.

On-road:
TxLED correction factor = 1 – 0.057 = ***0.943***

Non-road:
TxLED correction factor = 1 – 0.070 = ***0.93***

- Infrastructure activities—including infrastructure costs that are part of a broader repower, retrofit, replacement, or add-on project—are excluded from the statutory cost-effectiveness of $15,000 per ton. However, the TCEQ may limit the cost-effectiveness for each grant round.
- An activity is not eligible if it is required by any state or federal law, rule, regulation, memorandum of agreement, or other legally binding document. However, this restriction does not apply to an otherwise qualified activity—regardless of the State Implementation Plan's assumption that the change in equipment, vehicles, or operations will occur—if, on the date the grant is awarded, the change is not yet required by any state or federal law, rule, regulation, memorandum of agreement, or other legally binding document. This restriction also does not apply to the purchase of vehicles or equipment that is required only by local law or regulation, or by corporate or controlling board policy of a public or private entity. Demonstration projects used to demonstrate a technology that may be used to comply with an emissions-reduction requirement may be funded, as long as the reductions directly attributable to the demonstration project are not used to comply with those requirements.
- An activity involving a new emissions-reduction measure that would otherwise generate marketable credits under state or federal emissions-

reduction credit averaging, banking, or trading programs is not eligible for funding under this program unless:

  - the activity includes the transfer of the reductions that would otherwise be marketable credits to the State Implementation Plan or the owner or operator as provided under Texas Health and Safety Code 386.056; and
  - the reductions are permanently retired.

- The incremental cost of the proposed activity must be reduced by the value of any existing financial incentive that directly reduces the cost of the proposed activity, including tax credits or deductions, other grants, or any other public financial assistance.
- For infrastructure activities, the activity life must be a minimum of five years. The TCEQ will establish the required activity life for each grant period. Not less than 75 percent of the annual use of the electricity dispensed from the infrastructure—or the idling operation reduced—must take place in one or more of the eligible counties throughout the life of the project. For infrastructure activities involving marine vessels, not less than 75 percent of the annual use of the electricity dispensed from the infrastructure must take place in bays adjacent to one or more of the eligible counties, or in the Texas portion of the Gulf Intracoastal Waterway, throughout the life of the project.
- Annual use will normally be measured using hours of operation by the vehicles or equipment being provided the electricity from the infrastructure. Therefore, a grant recipient must have a viable mechanism for tracking and reporting on the use of the vehicles or equipment receiving electricity from the infrastructure.
- Applicants must agree to monitor the use of grant-funded vehicles, equipment, infrastructure, and fuel, and to report to the TCEQ for the life of each grant-funded activity. If the grant recipient does not own or operate the vehicles or equipment to receive electricity from the infrastructure, the recipient will need to explain, as a condition of the grant, what mechanism will be used to ensure that the vehicles and equipment are operated within the eligible counties for the specified time period.
- Applicants must also agree to notify the TCEQ of any changes in the following during the activity life: termination of use; change in use, sale, transfer, or accidental or intentional destruction of grant-funded vehicles, equipment, or infrastructure; or change in use of the qualifying fuel.
- Administrative costs and other internal costs of the grant recipient, including but not limited to personnel expenses, internal salaries, indirect costs, and travel are not eligible. This restriction also applies to situations where the grant recipient acts as a transportation provider for delivery of the grant-funded vehicle or equipment before or after accepting it.

- Consultant fees for the preparation of a grant application, either directly or as an addition of the cost basis of the grant-funded vehicle, equipment, or engine, are not eligible for reimbursement by the TCEQ.
- Fees for a third-party consultant hired by the grant recipient to manage and administer the grant-funded activities, including coordination of the work and submission of reports and paperwork to the TCEQ for the grant recipient, are not eligible. This restriction is not intended to limit the ability of the vehicle or equipment supplier to include reasonable and necessary costs for managing the work to be performed in the price of the vehicle, equipment, or installation services. The costs for professional services, including engineering and technical work, required for completion of the activity may be included, subject to the restrictions pertaining to that type of project. Per the Uniform Grant Management Standards, the cost plus a percentage of cost methods of contracting for professional services shall not be used.
- The TCEQ may impose additional criteria for certain projects and funding periods, consistent with these guidelines.

NO_X Emissions Standards

The baseline NO_X emissions standards for this program normally should be the federal standards for NO_X emissions applicable to the engines receiving electricity from the infrastructure. The federal NO_X emissions standards for various categories of engines are listed in the technical supplement available from the TCEQ. Potential grant applicants should consult with the TCEQ to ensure they use the appropriate baseline standards.

Calculating NO_X Emissions Reductions

In general, the emissions-reduction benefit represents the difference in the emissions level of a baseline engine and a reduced-emissions engine. For electrification infrastructure activities, the NO_X emissions reductions should be calculated based on information regarding the type of vehicles and equipment using the electricity.

Electrification of Vehicles and Equipment

Electrification infrastructure may be purchased to support the purchase of new electric vehicles or equipment in lieu of vehicles or equipment powered by internal combustion engines. Infrastructure may also be purchased to support the electrification of existing vehicles or equipment.

NO_X emissions reductions should be calculated based on the difference between the baseline emissions and the emissions from the electric-powered engine. In most cases, electric engines will be considered zero-emissions sources.

Grant applicants should refer to the chapter of this guide pertaining to the type of vehicle or equipment being purchased, repowered, or retrofitted for information on the methodology that should be used to determine the reductions in NO_X emissions attributable to the use of the electric-powered engine in lieu of an internal combustion engine. The applicable emissions factors for use in the calculations will generally appear in the technical supplement to these guidelines. Activities for which appropriate emissions factors do not appear should be discussed with the TCEQ.

The usage factor for electrification of on-road vehicles normally should be miles of operation, while the usage factor for non-road and stationary equipment normally should be hours of operation.

Normally, NO_X emissions that may be attributable to the generation of the electricity should not be considered in determining the NO_X emissions reductions, if the electricity is provided through the central power grid or other central power supply. However, if the electricity will come from a local generating source, any NO_X emissions from the source may need to be included in the calculations. As part of the grant application, the applicant will need to explain the source of the electricity.

Note that, if the vehicle or equipment purchases or conversions are included in the grant application as part of a combined project, the NO_X emissions reductions attributable to the overall project will only be counted once, in conjunction with the purchase or conversion activities.

Alternatively, if the purchases or conversions are to be funded from another source, the NO_X emissions reductions attributable to the electrification of the vehicles or equipment should be used to determine the reductions in NO_X emissions for the infrastructure project. The grant recipient must ensure that the NO_X emissions reductions are surplus and available to apply to this program, and are not already being claimed by the other funding program or for another purpose.

Idle Reduction

On-site electrification of truck stops, rest stops, and other areas may also be funded under this program, in support of idle-reduction programs to reduce NO_X emissions in the eligible counties. The NO_X emissions reductions are to be calculated based on the reduction in idling NO_X emissions for the engine.

In general, the emissions-reduction benefit represents the NO_X emissions that would have normally been generated by the engine at idle. The idling emissions

level is calculated by multiplying an emissions factor, an activity level, and a conversion factor, if necessary.

For most applications, the idling activity level should be established by the annual hours of idle operation. The calculation of emissions and emissions reductions based on annual hours of operation as the usage factor is determined by the steps shown in Table A7.1.

Table A7.1
Calculating the NO_X Idling Emissions Reduction Based on Annual Hours of Operation

Applying the TxLED Correction Factor

The counties affected by the TxLED requirements currently include all of the counties eligible for TERP incentive funding, as listed in Table 3.1, except for El Paso County.	
TxLED correction factor for on-road: *1 – 0.057*	0.943

Calculate the NO_X Idling Emissions Reduction

NO_X idling emissions factor (g/hr)	
× TxLED correction factor *(diesel engines only)*	
= grams per hour (g/hr)	
× annual hours of idling reduced (within the eligible county)	
= grams per year reduced (g/year)	
	÷ 907,200 grams per ton
= estimated annual NO_X emissions reduction (tons/yr)	
× activity life (years)	
= estimated activity-life NO_X emissions reduction (tons)	

Appropriate baseline NO_X idling emissions factors are included in the technical supplement to these guidelines. Use the emissions factors most closely associated with the vehicle or engine. Potential grant applicants should consult with the TCEQ to ensure they use the appropriate factors.

Normally, NO_X emissions that may be attributable to the generation of the electricity should not be considered in determining the NO_X emissions reductions, if the electricity is provided through the central power grid or other central power supply. However, if the electricity will come from a local generating source, any NO_X emissions from the generating source may need to be included in the calculations. As part of the grant application, the applicant will need to explain the source of the electricity.

Note that, if the vehicle or equipment purchases or conversions are included in the grant application as part of a combined project, the NO_X emissions reductions attributable to the overall project should only be counted once, in conjunction with the purchase or conversion activities.

Alternatively, if the purchases or conversions are to be funded from another source, the reductions in NO_X emissions attributable to the electrification of the vehicles or equipment should be used to determine the NO_X emissions reductions for the infrastructure project. The grant recipient must ensure that the NO_X emissions reductions are surplus and available to apply to this program, and are not already being claimed by the other funding program or for another purpose.

Calculating Cost-Effectiveness

Only the amount of incentive funds requested under the program should be used in cost-effectiveness calculations. The incremental costs for each activity must be reduced by the value of any existing financial incentive that directly reduces the cost of the proposed activity, including tax credits or deductions, other grants, or any other public financial assistance.

To determine the cost-effectiveness of an activity—with the exception of qualifying fuel activities—the incentive amount for the activity included in the project must be amortized over the activity life designated by the applicant, at a discount rate of 3 percent.

The following amortization formula yields a *capital-recovery factor* (CRF).

$$\text{capital-recovery factor} = \mathbf{[(1 + \mathit{i})^n (\mathit{i})] / [(1 + \mathit{i})^n - 1]}$$

where i = discount rate (3 percent)
n = activity life

The discount rate of 3 percent reflects the opportunity cost of public funds—the level of earning that reasonably could be expected by investing state funds in various financial instruments, such as U.S. Treasury securities.

The incentive amount should be multiplied by the incremental cost or incentive amount requested to determine the annualized cost.

$$\textit{Incremental cost} \times \textit{CRF} = \textit{annualized cost}$$

The cost-effectiveness calculations are presented in Table A7.2. Capital-recovery factors for up to 20 years are presented in Table A7.3, for use in the calculations.

Table A7.2
Calculating Cost-Effectiveness

Step 1. Determine the capital-recovery factor (CRF)	
$CRF = [(1 + i)^n (i)] / [(1 + i)^n - 1]$ i = discount rate (.03) n = activity life	
Capital-recovery factor:	
Step 2. Determine the annualized cost	
Incentive amount × CRF = annualized cost	
Annualized cost ($/year):	
Step 3. Determine cost-effectiveness	
Annualized cost ($/year) / annual NO_X emissions reduction (tons/year) = cost-effectiveness ($/ton)	
Cost-effectiveness ($/ton):	$

Table A7.3
Capital-Recovery Factors Using a Discount Rate of 0.03

Activity Life	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
CRF	1.00	.5226	.3535	.2690	.2184	.1846	.1605	.1425	.1284	.1172
Activity Life	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
CRF	.1081	.1005	.0940	.0885	.0838	.0796	.0760	.0727	.0698	.0672

For projects that include more than one activity, the total project incentive amount should be used to determine the cost-effectiveness of the project. The

applicant may request an incentive amount that is less than the full incremental costs, in order to meet the cost-effectiveness criteria.

To determine the cost-effectiveness: First sum all of the annualized costs for the activities included in the project. Also sum the annual emissions reductions of each activity should also be added together to determine an annual emissions reduction for the project. Then divide the combined annualized costs for all activities included in the project application by the total annual NO_X emissions reductions for the combined project activities.

Total annualized costs / total annual NO_X reductions = project cost-effectiveness

Appendix 8
On-Vehicle Electrification and Idle-Reduction Infrastructure

This section contains the project criteria for on-vehicle electrification and idle-reduction infrastructure. The emissions reductions should be estimated using the applicant's information on the type of vehicles or equipment on which the infrastructure is being installed. The emissions reduction for the activity will be the reduction in the idling emissions level in tons of NO_X expected to be produced by baseline vehicles, within the eligible counties.

The emissions standards and emissions factors applicable to this program are contained in a technical supplement, which will be made available in conjunction with these guidelines. Potential grant applicants should contact the TCEQ for copies of the supplement and for answers to questions about which emissions standards and factors to use.

Eligible Activities and Costs

An eligible activity may include the purchase and installation of equipment that enables a vehicle or equipment to use electric power to operate while the vehicle or equipment is parked, of the systems normally supplied power by the propulsion engine, or of another on-board internal combustion engine that emits NO_X.

Eligible equipment may include: (1) the add-on of devices to enable acceptance of electricity from an external power source or (2) the purchase and installation on the vehicle or equipment of an auxiliary power unit (APU) to generate electricity.

The TCEQ may also accept, case by case, idle-limiting devices for locomotives, as well as other types of idle-reduction devices.

Note, that in some areas of the state, idling operation of on-road vehicles may be limited by state regulations. Accordingly, the project emissions reductions used to determine the cost-effectiveness for infrastructure activities in an area with such a requirement may not include the replacement of idling hours of operation for on-road vehicles. Non-road equipment and other eligible uses of the electricity by on-road vehicles are not covered by this restriction.

The TCEQ may further limit the types of eligible activities, and may more narrowly define eligibility requirements, during a particular funding period or by geographic area, as needed to best achieve the objectives of the TERP.

The grant recipient may be eligible for reimbursement of the cost for the purchase and installation of the infrastructure. However, expenses for salaries, travel, land purchases, and overhead, including indirect costs, will not be covered. Costs that may be reimbursed by the TCEQ, subject to its approval, include:

- the invoice cost of the infrastructure equipment, including sales tax and delivery charges;
- the cost of associated supplies directly related to the installation of the infrastructure;
- installation costs;
- reengineering costs, if the vehicle or equipment must be modified to allow for installation of the infrastructure; and
- other costs directly related to the project.

All vehicles and equipment must be owned by the grant applicant, including the vehicle and equipment that will benefit from the add-on or idle-reduction infrastructure. All grant-funded add-on devices, APUs, and other idle-reduction equipment must be purchased and not leased.

Project Criteria

In addition to the eligibility criteria previously presented, the criteria listed below apply to projects involving electrification infrastructure. The TCEQ may impose additional criteria, and may more narrowly define the criteria established in the guide, during a particular funding period or by geographic area, as needed to best achieve the objectives of the TERP.

- One or more eligible **activities** of the same project type (i.e., on-road, non-road, locomotive, etc.) and that will occur in the same primary area may be included under one project application.
- Infrastructure used to service vehicles and equipment used primarily for competition or recreation is not eligible for funding.
- Infrastructure activities—including infrastructure costs that are part of a broader repower, retrofit, replacement, or add-on project—are excluded from the statutory cost-effectiveness limit of $15,000 per ton. However, the TCEQ may limit the cost-effectiveness for each grant round.
- An activity is not eligible if it is required by any state or federal law, rule, regulation, memorandum of agreement, or other legally binding document. However, this restriction does not apply to an otherwise qualified

activity—regardless of the State Implementation Plan's assumption that the change in equipment, vehicles, or operations will occur—if, on the date the grant is awarded, the change is not yet required by any state or federal law, rule, regulation, memorandum of agreement, or other legally binding document. This restriction also does not apply to the purchase of vehicles or equipment that is required only by local law or regulation, or by corporate or controlling board policy of a public or private entity. Demonstration projects used to demonstrate a technology that may be used to comply with an emissions reduction requirement may be funded, as long as the reductions directly attributable to the demonstration project are not used to comply with those requirements.

- In the areas of the state where Texas Low Emission Diesel (TxLED) is required, the baseline and reduced emissions rate calculations for diesel engine use after September 2005 must be adjusted using a correction factor, in addition to any other calculation adjustments.

Figure A8.1
Correction Factor for TxLED

The TCEQ adopted rules (30 TAC 114.312–319) requiring that diesel fuel sold or supplied for use in compression-ignition engines in certain counties in Texas must meet low-emission-diesel standards.

The counties affected by the TxLED requirements currently include all of the counties eligible for TERP incentive funding, as listed in Table 3.1, except for El Paso County.

The requirements set a maximum for content of aromatic hydrocarbons of 10 percent by volume. The requirements also set a minimum cetane number for TxLED of 48.

The TxLED requirements are intended to result in reductions in NO_x emissions from diesel engines. Currently, reduction factors of **5.7 percent** (0.057) for on-road use and **7.0 percent** (0.07) for non-road use have been accepted as estimates for use of TxLED. However, this reduction estimate is subject to change, based on the standards accepted by the EPA for use in the Texas State Implementation Plan. The TCEQ will identify the appropriate reduction factor to use in the technical supplement prepared to support these guidelines.

For activities in the applicable counties, a correction factor will need to be applied when calculating the baseline or reduced emissions for diesel engines.

On-road:
TxLED correction factor = 1 – 0.057 = ***0.943***

Non-road:
TxLED correction factor = 1 – 0.070 = ***0.93***

- An activity involving a new emissions-reduction measure that would otherwise generate marketable credits under state or federal emissions reduction credit averaging, banking, or trading programs is not eligible for funding under this program unless:

  - the activity includes the transfer of the reductions that would otherwise be marketable credits to the State Implementation Plan or the owner or operator as provided under Texas Health and Safety Code 386.056; and
  - the reductions are permanently retired.
- The incremental cost of the proposed activity must be reduced by the value of any existing financial incentive that directly reduces the cost of the proposed activity, including tax credits or deductions, other grants, or any other public financial assistance.
- For infrastructure activities, the activity life must be a minimum of five years. The TCEQ will establish the required activity life for each grant period. Not less than 75 percent of the annual use of the electricity dispensed from the infrastructure, or the idling operation reduced, projected for the activity life, must be projected to take place in one or more of the eligible counties. For infrastructure activities involving marine vessels, not less than 75 percent of the annual use of the electricity dispensed from the infrastructure projected for the activity life must be projected to take place in bays adjacent to one or more of the eligible counties, or in the Texas portion of the Gulf Intracoastal Waterway.
- Annual use will normally be measured using hours of idling operation by the vehicles or equipment being replaced by the electricity from the infrastructure.
- The TCEQ will determine an acceptable activity life for infrastructure activities case by case.
- Applicants must agree to monitor the use of grant-funded vehicles, equipment, infrastructure, and fuel, and to report to the TCEQ for the life of each grant-funded activity.
- Applicants must also agree to notify the TCEQ of any changes in the following during the activity life: termination of use; change in use, sale, transfer, or accidental or intentional destruction of grant-funded vehicles, equipment, or infrastructure; or change in use of the qualifying fuel.
- Administrative costs and other internal costs of the grant recipient, including but not limited to personnel expenses, internal salaries, indirect costs, and travel are not eligible. This restriction also applies to situations where the grant recipient acts as a transportation provider for delivery of the grant-funded vehicle or equipment before or after accepting it.
- Consultant fees for the preparation of a grant application, either directly or as an addition of the cost basis of the grant-funded vehicle, equipment, or engine, are not eligible for reimbursement by the TCEQ.
- Fees for a third-party consultant hired by the grant recipient to manage and administer the grant-funded activities, including coordination of the work and submission of reports and paperwork to the TCEQ for the grant recipient, are not eligible. This restriction is not intended to limit the ability of the vehicle

or equipment supplier or installer to include reasonable and necessary costs for managing the work to be performed in the price of the vehicle, equipment, or installation services. The costs for professional services, including engineering and technical work, required for completion of the activity may be included, subject to the restrictions pertaining to that type of project. Per the Uniform Grant Management Standards, the cost plus a percentage of cost methods of contracting for professional services shall not be used.

- The TCEQ may impose additional criteria for certain projects and funding periods, consistent with these guidelines.

NO_X Emissions Standards

The baseline NO_X emissions standards for this program normally should be the federal standards for NO_X emissions applicable to the engines being provided the electricity from the infrastructure. The federal NO_X emissions standards for various categories of engines are listed in the technical supplement available from the TCEQ. Potential grant applicants should consult with the TCEQ to ensure they use the appropriate baseline standards.

Calculating NO_X Emissions Reductions

In general, the emissions-reduction benefit represents the difference in the emissions level of a baseline engine and the auxiliary power unit, if it emits NO_X. For infrastructure to allow a vehicle or equipment to accept electricity from an external source, the emissions-reduction benefit will be the reduction in emissions from the on-board internal combustion engine as a result of the use of electricity.

For APUs and idle-limiting devices on locomotives, the emissions-reduction benefit will need to be determined by the reduction in fuel use or hours of idling operation. Grant applicants should consult with the TCEQ to determine the most appropriate methodology to use in calculating the reductions in NO_X emissions attributable to these types of locomotive projects.

The NO_X emissions reductions should be calculated based on information regarding the type of vehicles and equipment using the electricity. The idling emissions level is calculated by multiplying an emissions factor, an activity level, and a conversion factor, if necessary.

Calculating NO_X Idling Emissions Reductions Based on Hours of Operation

For most applications, the idling activity level should be established by the annual hours of idle operation. The calculation of emissions and emissions reductions based on annual hours of operation as the usage factor is determined by the steps shown in Table A8.1.

Table A8.1
Calculating the Idling NO_X Emissions Reduction Based on Annual Hours of Operation

Applying the TxLED Correction Factor

The counties affected by the TxLED requirements currently include all of the counties eligible for TERP incentive funding, as listed in Table 3.1, except for El Paso County.	
TxLED correction factor for on-road: *1 – 0.057*	0.943

Calculate the NO_X Idling Emissions Reduction

Baseline		APU	
NO_X Idling emissions factor (g/hr)		APU NO_X emissions factor (g/bhp-hr)	
		× TxLED correction factor *(diesel engines only)*	
× TxLED correction factor *(diesel engines only)*		× APU load factor	
		× APU horsepower	
= NO_X emissions factor (g/hr)		= NO_X emissions factor (g/hr)	
Baseline g/hr – APU emissions g/hr			
× annual idling hours			
× percent within eligible counties (%)			
= grams per year reduced (g/yr)			
		÷ 907,200 grams per ton	
= estimated annual NO_X emissions reduction (tons/yr)			
× activity life (years)			
= estimated activity-life NO_X emissions reduction (tons)			

For activities involving the add-on of idle-limiting devices or devices to enable acceptance of electricity from an external power source, the emissions reductions can be calculated using just the baseline emissions. The APU emissions would be set at zero.

Appropriate baseline NO_X idling emissions factors, APU NO_X emissions standards, and APU load factors appear in the technical supplement to these guidelines. Use the factors most closely associated with the vehicle or engine. Potential grant applicants should consult with the TCEQ to ensure they use the appropriate factors.

Calculating Cost-Effectiveness

Only the amount of incentive funds requested under the program should be used in cost-effectiveness calculations. The incremental costs for each activity must be reduced by the value of any existing financial incentive that directly reduces the cost of the proposed activity, including tax credits or deductions, other grants, or any other public financial assistance.

To determine the cost-effectiveness of an activity—with the exception of qualifying fuel activities—the incentive amount for the activity included in the project must be amortized over the activity life designated by the applicant, at a discount rate of 3 percent.

The following amortization formula yields a *capital-recovery factor* (CRF).

$$\text{capital-recovery factor} = \mathbf{[(1 + i)^n (i)] / [(1 + i)^n - 1]}$$

where i = discount rate (3 percent)
n = activity life

The discount rate of 3 percent reflects the opportunity cost of public funds—the level of earning that reasonably could be expected by investing state funds in various financial instruments, such as U.S. Treasury securities.

The incentive amount should be multiplied by the incremental cost or incentive amount requested to determine the annualized cost.

$$\textit{Incremental cost} \times \textit{CRF} = \textit{annualized cost}$$

The cost-effectiveness calculations are presented in Table A8.2. Capital-recovery factors for up to 20 years are presented in Table A8.3, for use in the calculations.

Table A8.2
Calculating Cost-Effectiveness

Step 1. Determine the capital-recovery factor (CRF)	
$CRF = [(1 + i)^n (i)] / [(1 + i)^n - 1]$ i = discount rate (.03) n = activity life	
Capital-recovery factor:	
Step 2. Determine the annualized cost	
Incentive amount × CRF = annualized cost	
Annualized cost ($/year):	
Step 3. Determine cost-effectiveness	
Annualized cost ($/year) / annual NO_X emissions reduction (tons/year) = cost-effectiveness ($/ton)	
Cost-effectiveness ($/ton):	$

Table A8.3
Capital-Recovery Factors Using a Discount Rate of 0.03

Activity Life	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
CRF	1.00	.5226	.3535	.2690	.2184	.1846	.1605	.1425	.1284	.1172
Activity Life	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
CRF	.1081	.1005	.0940	.0885	.0838	.0796	.0760	.0727	.0698	.0672

For projects that include more than one activity, the total project incentive amount should be used to determine the cost-effectiveness of the project. The applicant may request an incentive amount that is less than the full incremental costs, in order to meet the cost-effectiveness criteria.

To determine the cost-effectiveness: First sum all of the annualized costs for the activities included in the project. Also sum the annual emissions reductions of each activity should also be added together to determine an annual emissions reduction for the project. Then divide the combined annualized costs for all activities included in the project application by the total annual NO_X emissions reductions for the combined project activities.

Total annualized costs / total annual NO_X reductions = project cost-effectiveness

Appendix 9
Rail Relocation and Improvements

This appendix contains the project criteria for rail-relocation and rail-improvement projects that assist in reducing air pollution and engine idling. This type of project must be applied for separately from the other eligible activities.

Applicants should estimate reductions in emissions based on the type of relocation or improvements. The emissions reduction for the activity will be the difference in the emissions level in tons of NO_X expected to be produced by existing conditions, and the emissions level in tons of NO_X expected after the rail relocation or improvements, within the eligible counties.

Eligible Activities and Costs

An eligible activity may include the relocation of rail lines to reduce the number of grade crossings, improvements at rail intersections, and other improvements that will directly result in the reduction of locomotive engine idling at rail intersections and other locations. The grant recipient must own or otherwise control the rail line, the right-of-way, or the facility being improved.

The TCEQ may consider various congestion-mitigation projects. Funding decisions may be based on the likelihood that the emissions reductions will be proven and accepted.

The applicant will need to show that the project is viable and can be expected to achieve significant reductions in NO_X emissions.

The TCEQ may further limit the types of eligible activities, and may more narrowly define eligibility requirements, during a particular funding period or by geographic area, as needed to best achieve the objectives of the TERP.

The grant recipient may be eligible for reimbursement of the costs of the rail relocation or improvements. Costs that may be reimbursed by the TCEQ, subject to its approval, include:

- the costs of design and engineering work directly necessary for completing the improvements;
- permitting and governmental fees needed to complete any site improvements or construction;

- costs for new construction or reengineering costs for modifications of an existing site;
- invoice cost of equipment or other infrastructure, including sales tax and delivery charges;
- the cost of associated supplies directly related to the installation of the equipment or infrastructure;
- installation costs; and
- other costs directly related to the projects.

All grant-funded equipment will be required to be purchased, not leased. Studies and plans will not be eligible for reimbursement by the TCEQ.

Project Criteria

In addition to the eligibility criteria previously presented, the following list of criteria applies to rail-improvement projects. The TCEQ may impose additional criteria, and may more narrowly define the criteria established in this guide, during a particular funding period or by geographic area, as needed to best achieve the objectives of the TERP.

- An activity under the category must be submitted on a separate application.
- The project must result in new, surplus emissions reductions that will be available to the TCEQ for assignment to the State Implementation Plan.
- In general, a project should involve proven techniques that ensure a reduction in air pollution.
- The project must take place within an eligible county.
- Infrastructure activities—including infrastructure costs that are part of a broader repower, retrofit, replacement, or add-on project—are excluded from the statutory cost-effectiveness limit of $15,000 per ton. However, the TCEQ may limit the cost-effectiveness for each grant round.
- An activity is not eligible if it is required by any state or federal law, rule, regulation, memorandum of agreement, or other legally binding document. However, this restriction does not apply to an otherwise qualified activity—regardless of the State Implementation Plan's assumption that the change in equipment, vehicles, or operations will occur—if, on the date the grant is awarded, the change is not yet required by any state or federal law, rule, regulation, memorandum of agreement, or other legally binding document. This restriction also does not apply to the purchase of vehicles or equipment that is required only by local law or regulation, or by corporate or controlling board policy of a public or private entity. Demonstration projects used to demonstrate a technology that may be used to comply with an emissions-reduction requirement may be funded, as long as the reductions

directly attributable to the demonstration project are not used to comply with those requirements.

- An activity involving a new emissions-reduction measure that would otherwise generate marketable credits under state or federal emissions-reduction-credit averaging, banking, or trading programs is not eligible for funding under this program unless:
  - the activity includes the transfer of the reductions that would otherwise be marketable credits to the State Implementation Plan or the owner or operator as provided under Texas Health and Safety Code 386.056; and
  - the reductions are permanently retired.
- The incremental cost of the proposed activity must be reduced by the value of any existing financial incentive that directly reduces the cost of the proposed activity, including tax credits or deductions, other grants, or any other public financial assistance.
- The activity life must be a minimum of five years. The TCEQ will determine an acceptable maximum activity life for infrastructure activities case by case.
- A grant recipient must have a viable mechanism for tracking and reporting on the emissions reduced by the project.
- Applicants must agree to monitor the use of grant-funded equipment and infrastructure, and to report to the TCEQ for the life of each grant-funded activity.
- Applicants must also agree to notify the TCEQ of any changes in the following during the activity life: termination of use; change in use, sale, transfer, or accidental or intentional destruction of grant-funded vehicles, equipment, or infrastructure; or change in use of the qualifying fuel.
- Administrative costs and other internal costs of the grant recipient, including but not limited to personnel expenses, internal salaries, indirect costs, and travel are not eligible. This restriction also applies to situations where the grant recipient acts as a transportation provider for delivery of the grant-funded vehicle or equipment before or after accepting it.
- Consultant fees for the preparation of a grant application, either directly or as an addition of the cost basis of the grant-funded vehicle, equipment, or engine, are not eligible for reimbursement by the TCEQ.
- Fees for a third-party consultant hired by the grant recipient to manage and administer the grant-funded activities, including coordination of the work and submission of reports and paperwork to the TCEQ for the grant recipient, are not eligible. This restriction is not intended to limit the ability of the vehicle or equipment supplier or installer to include reasonable and necessary costs for managing the work to be performed in the price of the vehicle, equipment, or installation services. The costs for professional services, including engineering and technical work, required for completion of the activity may be included, subject to the restrictions pertaining to that type

of project. Per the Uniform Grant Management Standards, the cost plus a percentage of cost methods of contracting for professional services shall not be used.

- The TCEQ may impose additional criteria for certain projects and funding periods, consistent with these guidelines.

NO_X Emissions Standards

The baseline NO_X emissions standards will be based on the federal standards for NO_X emissions applicable to the category of locomotive for which idle time will be reduced. In general, baseline idling emissions should be based on EPA- or TCEQ-approved estimates for locomotive engine idle emissions. Default idling emissions factors of 800 grams of NO_X per hour for two-stroke engines and 620 grams per hour for four-stroke engines may be considered by the TCEQ.

Calculating NO_X Emissions Reductions

In general, the emissions reduction benefit should be calculated based on the projected number of hours of engine idling reduced, multiplied by an idle-emissions factor for that type of locomotive. The calculation of emissions and emissions reductions using annual hours of idling operation reduced is determined by the steps shown in Table A9.1.

Table A9.1
Calculating the Idling NO_X Emissions Reduction Based on Annual Hours of Operation

Applying the TxLED Correction Factor

The counties affected by the TxLED requirements currently include all of the counties eligible for TERP incentive funding, as listed in Table 3.1, except for El Paso County.	
TxLED correction factor for non-road: *1 – 0.07*	0.93

Calculate the NO_X Idling Emissions Reduction

NO_X idling emissions factor (g/hr)	
× TxLED correction factor *(diesel engines only)*	
= grams per hour (g/hr)	
× annual hours of idling reduced (within the eligible county)	
= grams per year reduced (g/year)	
	÷ 907,200 grams per ton
= estimated annual NO_X emissions reduction (tons/yr)	
× activity life (years)	
= estimated activity-life NO_X emissions reduction (tons)	

Reductions in vehicle engine idling that are directly attributable to the project may also be included in the calculation of its emission reductions, subject to a determination by the TCEQ that those additional reductions are verifiable and will be enforceable under the grant contract.

Because of the nature of this type of project, it will be the applicant's responsibility to verify the types of locomotives and the number of locomotive engine idling hours, as well as any reductions in vehicle engine idling to be included in the project, that will be reduced annually as a result of the rail line relocation or improvements. All studies and reports to show the projected reduction in locomotive engine idling and vehicle engine idling must be completed before an application is made, and those studies and reports must be submitted with a grant application.

It is recommended that interested parties meet with TCEQ staff before submitting an application to discuss the information that will be used to verify reductions in engine idling.

Calculating Cost-Effectiveness

Only the amount of incentive funds requested under the program should be used in cost-effectiveness calculations. The incremental costs for each activity must be reduced by the value of any existing financial incentive that directly reduces the cost of the proposed activity, including tax credits or deductions, other grants, or any other public financial assistance.

To determine the cost-effectiveness of an activity—with the exception of qualifying fuel activities—the incentive amount for the activity included in the project must be amortized over the activity life designated by the applicant, at a discount rate of 3 percent.

The following amortization formula yields a *capital-recovery factor* (CRF).

$$\text{capital-recovery factor} = \mathbf{[(1 + \mathit{i})^{n} (\mathit{i})] / [(1 + \mathit{i})^{n} - 1]}$$

where i = discount rate (3 percent)
n = activity life

The discount rate of 3 percent reflects the opportunity cost of public funds—the level of earning that reasonably could be expected by investing state funds in various financial instruments, such as U.S. Treasury securities.

The incentive amount should be multiplied by the incremental cost or incentive amount requested to determine the annualized cost.

$$\textit{Incremental cost} \times \textit{CRF} = \textit{annualized cost}$$

The cost-effectiveness calculations are presented in Table A9.1. Capital-recovery factors for up to 20 years are presented in Table 9-2, for use in the calculations.

Table A9.1
Calculating Cost-Effectiveness

Step 1. Determine the capital-recovery factor (CRF)	
$CRF = [(1 + i)^n (i)] / [(1 + i)^n - 1]$ i = discount rate (.03) n = activity life	
Capital-recovery factor:	
Step 2. Determine the annualized cost	
Incentive amount × CRF = annualized cost	
Annualized cost ($/year):	
Step 3. Determine cost-effectiveness	
Annualized cost ($/year) / annual NO_X emissions reduction (tons/year) = cost-effectiveness ($/ton)	
Cost-effectiveness ($/ton):	$

Table A9.2
Capital-Recovery Factors Using a Discount Rate of 0.03

Activity Life	1	2	3	4	5	6	7	8	9	10
CRF	1.00	.5226	.3535	.2690	.2184	.1846	.1605	.1425	.1284	.1172
Activity Life	11	12	13	14	15	16	17	18	19	20
CRF	.1081	.1005	.0940	.0885	.0838	.0796	.0760	.0727	.0698	.0672

For projects that include more than one activity, the total project incentive amount should be used to determine the cost-effectiveness of the project. The applicant may request an incentive amount that is less than the full incremental costs, in order to meet the cost-effectiveness criteria.

To determine the cost-effectiveness: First sum all of the annualized costs for the activities included in the project. Also sum the annual emissions reductions of each activity should also be added together to determine an annual emissions reduction for the project. Then divide the combined annualized costs for all activities included in the project application by the total annual NO_X emissions reductions for the combined project activities.

Total annualized costs / total annual NO_X reductions = project cost-effectiveness

Appendix 10
Use of Qualifying Fuel

This section contains the project criteria for the purchase and use of a qualifying fuel or fuel additives. In order to be considered a qualifying fuel, the fuel or fuel additive must be verified by the EPA or the CARB, or otherwise accepted by the TCEQ as resulting in lower emissions of NO_X than the baseline fuel for the vehicle or equipment in which the qualifying fuel or additive is used. The baseline fuel used for comparison normally will be either standard on-road or non-road diesel fuel, or gasoline.

The methods for calculating the NO_X emissions reductions for a qualifying fuel project also appear in this chapter. Most of the calculations will require input of a NO_X emissions factor applicable to the engine or vehicle. The emissions standards and factors applicable to this program appear in a technical supplement, which will be made available in conjunction with these guidelines. Potential grant applicants should contact the TCEQ for copies of the supplement and for answers to questions about which emissions standards and factors to use.

Eligible Activities and Costs

The reimbursements for incremental fuel costs under this category should be made over the life of the activity, based on the actual amount of fuel purchased and the cost of that fuel. The incentive amounts included in the grant contract are not to exceed a maximum amount that may be reimbursed under the grant. The actual reimbursement will depend upon the cost differential between the baseline fuel and the qualifying fuel at the time of the purchase. Administrative costs, in-house labor costs, and travel costs are not eligible expenses.

In some cases, the TCEQ may pre-approve a reimbursement amount per unit of qualifying fuel, for all activities using the fuel. Grant applicants and suppliers of qualifying fuel may consult with the TCEQ regarding alternative approaches for establishing an approved reimbursement amount.

Project Criteria

In addition to the eligibility criteria previously presented, the following list of criteria applies to projects involving qualifying fuel activities. The TCEQ may impose additional criteria, and may more narrowly define the criteria established in this guide, during a particular funding period or by geographic area, as needed to best achieve the objectives of the TERP.

- One or more eligible **activities** of the same project type (i.e., on-road, non-road, locomotive, etc.) that will occur in the same primary area may be included under one project application.
- Fuel used in vehicles and equipment used primarily for competition or recreation is not eligible for funding.
- When required under federal law, fuel additives must be registered by the EPA to be eligible under this program.
- When required, qualifying fuel to be used in on-road vehicles must be registered by the EPA for on-road use to be eligible under this program.
- The NO_X emissions reductions attributable to the qualifying fuel must be verified by the EPA or the CARB, or accepted on other grounds by the TCEQ.
- Qualifying fuel technologies will be reviewed by the TCEQ's technical staff. Any questions regarding the effects of a fuel or fuel additive on health or the environment will need to be resolved before the fuel is considered eligible for funding. Manufacturers and suppliers of a qualifying fuel are encouraged to discuss their products with the TCEQ early in the process, before submitting a grant application.
- The cost-effectiveness of a project, other than a demonstration project, must not exceed $15,000 per ton of NO_X emissions reduced in the eligible counties for which the project is proposed. Individual activities included under a single project application may exceed this amount, but the combined project must meet the cost-effectiveness standard.
- In the areas of the state where Texas Low Emission Diesel (TxLED) is required, the baseline and reduced emissions rate calculations for diesel engine usage after September 2005 must be adjusted using a correction factor, in addition to any other calculation adjustments.

Figure A10.1
Correction Factor for TxLED

The TCEQ adopted rules (30 TAC 114.312–319) requiring that diesel fuel sold or supplied for use in compression-ignition engines in certain counties in Texas must meet low-emission-diesel standards.

The counties affected by the TxLED requirements currently include all of the counties eligible for TERP incentive funding, as listed in Table 3.1, except for El Paso County.

The requirements set a maximum for content of aromatic hydrocarbons of 10 percent by volume. The requirements also set a minimum cetane number for TxLED of 48.

The TxLED requirements are intended to result in reductions in NO_x emissions from diesel engines. Currently, reduction factors of **5.7 percent** (0.057) for on-road use and **7.0 percent** (0.07) for non-road use have been accepted as estimates for use of TxLED. However, this reduction estimate is subject to change, based on the standards accepted by the EPA for use in the Texas State Implementation Plan. The TCEQ will identify the appropriate reduction factor to use in the technical supplement prepared to support these guidelines.

For activities in the applicable counties, a correction factor will need to be applied when calculating the baseline or reduced emissions for diesel engines.

On-road:
TxLED correction factor = 1 – 0.057 = ***0.943***

Non-road:
TxLED correction factor = 1 – 0.070 = ***0.93***

- An activity is not eligible if it is required by any state or federal law, rule, regulation, memorandum of agreement, or other legally binding document. However, this restriction does not apply to an otherwise qualified activity—regardless of the State Implementation Plan's assumption that the change in equipment, vehicles, or operations will occur—if, on the date the grant is awarded, the change is not yet required by any state or federal law, rule, regulation, memorandum of agreement, or other legally binding document. This restriction also does not apply to the purchase of vehicles or equipment that is required only by local law or regulation, or by corporate or controlling board policy of a public or private entity. Demonstration projects used to demonstrate a technology that may be used to comply with an emissions-reduction requirement may be funded, as long as the reductions directly attributable to the demonstration project are not used to comply with those requirements.
- An activity involving a new emissions-reduction measure that would otherwise generate marketable credits under state or federal emissions-reduction credit averaging, banking, or trading programs is not eligible for funding under this program unless:
    - the activity includes the transfer of the reductions that would otherwise be marketable credits to the State Implementation Plan, or

the owner or operator, as provided under Texas Health and Safety Code 386.056; and

- the reductions are permanently retired.

- The incremental cost of the proposed activity must be reduced by the value of any existing financial incentive that directly reduces the cost of the proposed activity, including tax credits or deductions, other grants, or any other public financial assistance.
- The use of qualifying fuel funded under this program must take place in one or more of the eligible counties.
- For most qualifying fuel activities, annual use will be measured using calculations based on the fuel use. The TCEQ may consider using either miles of operation or hours of operation using the qualifying fuel for particular applications, case by case.
- Applicants must agree to monitor the use of grant-funded vehicles, equipment, infrastructure, and fuel, and to report to the TCEQ for the life of each grant-funded activity.
- Applicants must also agree to notify the TCEQ of any changes in the following during the activity life: termination of use; change in use, sale, transfer, or accidental or intentional destruction of grant-funded vehicles or equipment; or change in use of the qualifying fuel.
- Administrative costs and other internal costs of the grant recipient, including but not limited to personnel expenses, internal salaries, indirect costs, and travel are not eligible. This restriction also applies to situations where the grant recipient acts as a transportation provider for delivery of the grant-funded vehicle or equipment before or after accepting it.
- Consultant fees for the preparation of a grant application, either directly or as an addition of the cost basis of the grant-funded vehicle, equipment, or engine, are not eligible for reimbursement by the TCEQ.
- Fees for a third-party consultant hired by the grant recipient to manage and administer the grant-funded activities, including coordination of the work and submission of reports and paperwork to the TCEQ for the grant recipient, are not eligible. This restriction is not intended to limit the ability of the vehicle or equipment supplier or installer to include reasonable and necessary costs for managing the work to be performed in the price of the vehicle, equipment, or installation services. The costs for professional services, including engineering and technical work, required for completion of the activity may be included, subject to the restrictions pertaining to that type of project. Per the Uniform Grant Management Standards, the cost plus a percentage of cost methods of contracting for professional services shall not be used.
- The TCEQ may impose additional criteria for certain projects and funding periods, consistent with these guidelines.

NO_X Emissions Standards

The baseline NO_X emissions standards for this program should be the federal standards for NO_X emissions applicable to the type of engine and model year of vehicle. The federal NO_X emissions standards for engines are listed in a technical supplement available from the TCEQ. Potential grant applicants should consult with the TCEQ to ensure they use the appropriate baseline standards.

Calculating NO_X Emissions Reductions

The NO_X emissions reductions for a qualifying-fuel activity will be based on the types of vehicles and equipment using the fuel. Grant applicants should refer to the chapter or chapters of these guidelines applicable to the vehicles and equipment being fueled, to determine how the emissions reductions will be calculated.

In most cases, reductions in NO_X emissions should be based on the difference between the NO_X emissions using the baseline fuel and the NO_X emissions using the qualifying fuel. The grant applicant will be required to list the vehicles and equipment that will be fueled using the qualifying fuel.

For many types of qualifying fuel, the TCEQ may allow applicants to list the vehicles and equipment by category, rather than listing each individual vehicle or piece of equipment. The technical supplement to these guidelines will include information on the categories that may be used.

Calculating Cost-Effectiveness

Only the amount of incentive funds requested under the program should be used in cost-effectiveness calculations. The incremental costs for each activity must be reduced by the value of any existing financial incentive that directly reduces the cost of the proposed activity, including tax credits or deductions, other grants, or any other public financial assistance.

The cost-effectiveness of qualifying fuel activities should be determined somewhat differently than for other activities. Whereas the incentive amount for other types of activities must be amortized over the activity life, using a 3 percent discount rate, the incentive amount for qualifying fuel activities does not need to be amortized. Cost-effectiveness calculations are presented in Table A10.1.

Table A10.1
Calculating Cost-Effectiveness for Qualifying Fuel Activities

Total cost ($) / total NO_X emissions reduction (tons) = cost-effectiveness ($/ton)	
Cost-effectiveness ($/ton):	$

For projects that include more than one activity, the total project incentive amount should be used to determine cost-effectiveness. The applicant may request an incentive amount that is less than the full incremental costs, in order to meet the cost-effectiveness criteria.

To determine the cost-effectiveness: First sum all of the annualized costs for the activities included in the project. For purposes of calculating the cost-effectiveness of a project that includes other types of activities, the annualized cost for the qualifying fuel activity should be the total activity cost. Also sum the annual emissions reductions of each activity to determine an annual emissions reduction for those activities. Again, the total emissions reductions for the qualifying fuel activity should be added to the annualized emissions reductions from the other activities. Then divide the combined annualized costs for all activities included in the project application by the total annual NO_X emissions reductions for the combined project activities.

Total annualized costs / total annual NO_X reductions = project cost-effectiveness

Appendix 11
Demonstration of New Technology

This section contains the project criteria for projects demonstrating new technology. A project of this type must be applied for separately from other eligible activities.

Eligible Activities and Costs

In general, the emissions reductions attributable to the technologies demonstrated under this program should already be proven—for example, through certification or verification by the EPA or the CARB. This program can then help encourage the implementation and use of the technology in the areas of the state where the emissions reductions are needed.

However, the TCEQ may also consider technologies that are still in the testing or verification stage of development. Funding decisions may be based on the likelihood that the emissions reductions will be proven and accepted.

The grant recipient may be eligible for reimbursement of all expenses attributable to the project. No cost-effectiveness requirements will be applied to a demonstration project, but the applicant will need to show that the technology is viable and can be expected to achieve significant reductions in NO_X emissions. Administrative costs, in-house labor costs, and travel costs are not eligible expenses.

Project Criteria

In addition to the eligibility criteria previously presented, the following list of criteria applies to projects involving demonstration of new-technology activities. The TCEQ may impose additional criteria, and may more narrowly define the criteria established in this guide, during a particular funding round or by geographic area, as needed to best achieve the objectives of the TERP.

- The TCEQ will select demonstration projects case by case, based on a full review of the project proposal and a determination that the project can lead to broader use of the technology.

- In general, a demonstration project should involve a limited number of vehicles or equipment (for example, one to five), so that the project can be considered a demonstration and not implementation of the technology.
- The demonstration project must take place within an eligible county. However, testing and other work required for completing the project may take place outside of the eligible counties, subject to approval by the TCEQ.
- Unless otherwise authorized by the TCEQ, the technology must be demonstrated on vehicles or equipment that are actually being used for intended purposes. Again, projects under this category normally should be for demonstrated technologies in real-world applications.
- Demonstration projects will normally last one year, but the TCEQ will consider projects that last for a different period. However, due to contracting and financial management requirements, projects may not extend beyond 18 months after the end of the state fiscal year of the grant award. The state fiscal year extends from September 1 through August 31.
- The grant recipient must monitor the use and effectiveness of the technology, including associated costs. At the end of the project, the recipient must prepare a project report with information and conclusions regarding the effectiveness and efficacy of using the technology in the application demonstrated. The project report must be accepted by the TCEQ before the project will be considered completed.
- An activity is not eligible if it is required by any state or federal law, rule, regulation, memorandum of agreement, or other legally binding document. However, this restriction does not apply to an otherwise qualified activity—regardless of the State Implementation Plan's assumption that the change in equipment, vehicles, or operations will occur—if, on the date the grant is awarded, the change is not yet required by any state or federal law, rule, regulation, memorandum of agreement, or other legally binding document. This restriction also does not apply to the purchase of vehicles or equipment that is required only by local law or regulation, or by corporate or controlling board policy of a public or private entity. Demonstration projects used to demonstrate a technology that may be used to comply with an emissions-reduction requirement may be funded, as long as the reductions directly attributable to the demonstration project are not used to comply with those requirements.
- An activity involving a new emissions-reduction measure that would otherwise generate marketable credits under state or federal emissions-reduction credit averaging, banking, or trading programs is not eligible for funding under this program unless:
    - the activity includes the transfer of the reductions that would otherwise be marketable credits to the State Implementation Plan or the owner or operator as provided under Texas Health and Safety Code 386.056; and
    - the reductions are permanently retired.

- Administrative costs and other internal costs of the grant recipient, including but not limited to personnel expenses, internal salaries, indirect costs, and travel are not eligible. This restriction also applies to situations where the grant recipient acts as a transportation provider for delivery of the grant-funded vehicle or equipment before or after accepting it.
- Consultant fees for the preparation of a grant application, either directly or as an addition of the cost basis of the grant-funded vehicle, equipment, or engine, are not eligible for reimbursement by the TCEQ.
- Fees for a third-party consultant hired by the grant recipient to manage and administer the grant-funded activities, including coordination of the work and submission of reports and paperwork to the TCEQ for the grant recipient, are not eligible. This restriction is not intended to limit the ability of the vehicle or equipment supplier or installer to include reasonable and necessary costs for managing the work to be performed in the price of the vehicle, equipment, or installation services. The costs for professional services, including engineering and technical work, required for completion of the activity may be included, subject to the restrictions pertaining to that type of project. Per the Uniform Grant Management Standards, the cost plus a percentage of cost methods of contracting for professional services shall not be used.
- The TCEQ may impose additional criteria for certain projects and funding periods, consistent with these guidelines.